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ABSTRACT

This instructor's manual consists of materials for use in introducing middle and junior high school students to job requirements and career opportunities in the areas of agribusiness and natural resource exploration. Included in the first part of the manual are a program master sequence, a listing of various agricultural and mining occupations organized according to job family, and an overview of the competency-based vocational education (CBVE) instructional system for the practical arts. The major part of the publication comprises instructor's guide sheets and student task assignment sheets. Provided on each of the guide sheets are a task title, an objective, a discussion of attitudes and values to be developed through the task, an instructor's final checklist, one or more check-out activities, notes and suggestions for the teacher, a listing of references and special tools and equipment, and information to be presented to students. One or more student task assignment sheets are included for each of the following job families: farm production, nursery production, livestock production, gardening and groundskeeping, mechanics, professional agricultural occupations, forestry, mining, and petroleum. Each of these task sheets contains some or all of the following: a task title, an introduction, objectives, one or more learning activities, one or more check-out activities, and a copy of the instructor's final checklist. The appendixes include a vocabulary listing, suggested references appropriate for career exploration, and guidelines for addressing students with special needs. (MN)

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PRACTICAL ARTS

Agribusiness/Natural Resources Exploration

Directed by

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1983

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[Student Task Assignment Sheets]

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Editors: Suzanne Patterson, Bobby Crosswhite
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Media Specialist: Tom Vantreese
Word Processors: Renita Van, Sheila Warren

PROGRAM MASTER SEQUENCE
PRACTICAL ARTS

Agribusiness/Natural Resources Exploration

CODE NUMBER		MODULE STOCK NUMBER	SLIDE STOCK NUMBER	TAPE STOCK NUMBER
	AGRIBUSINESS			
	HORTICULTURE FAMILY			
PA-AG/NR-1	Taking Soil Samples	6-240	*	*
PA-AG/NR-2	Planting Shrubs and Trees	6-241	*	*
PA-AG/NR-3	Potting Plants	6-242	*	*
PA-AG/NR-4	Pruning Shrubs and Hedges for Shaping	6-243	*	*
	GRADENING AND GROUNDSKEEPING FAMILY			
PA-AG/NR-5	Preparing a Lawn Seed Bed	6-244	*	*
PA-AG/NR-6	Sowing a Lawn	6-245	*	*
	MECHANICS FAMILY			
PA-AG/NR-7	Cleaning a Small Engine	6-246	*	*
PA-AG/NR-8	Operating a Small Engine	6-247	*	*
	LIVESTOCK PRODUCTION FAMILY			
PA-AG/NR-9	Identifying Breeds of Beef Cattle	6-248	*	*
	NATURAL RESOURCES			
	MINING FAMILY			
PA-AG/NR-10	Identifying Parts of an Underground Coal Mine	6-249	*	*
PA-AG/NR-11	Identifying Basic Mining Equipment	6-250	*	*
	PETROLEUM FAMILY			
PA-AG/NR-12	Classifying Rocks and Minerals	6-251	*	*
	FORESTRY FAMILY			
PA-AG/NR-13	Identifying Parts of a Tree	6-252	*	*
PA-AG/NR-14	Identifying Trees to be Harvested	6-253	*	*

AGRIBUSINESS/NATURAL RESOURCES OCCUPATIONS

AGRIBUSINESS

Farm Production Job Family

- Farm Operator
- Farm Laborer
- Farm Labor Supervisor
- Agronomist
- Soil Scientist
- Irrigator
- Produce Sorter
- Produce Packer
- Tobacco Grader

Nursery Production Job Family

- Rose-Grading Supervisor
- Dwarf Tree Grower
- Plant Propagator
- Bulbs Farmworker
- Mushroom Grower
- Budder
- Flower Picker
- Orchard Transplanter
- Greenhouse Laborer

Livestock Production Family

- Animal Breeder
- Artifical-Breeding Technician
- Artifical Inseminator
- Veterinarian
- Animal Physiologist
- Animal Scientist

Gardening and Groundskeeping Job Family

- Greenskeeper
- Cemetary Worker
- Special Effects Gardener
- Parks and Grounds Groundskeeper
- Industrial-Commercial Groundskeeper

Mechanics Job Family

- Farm Equipment Mechanic
- Farm Equipment Dealer

Professional Job Family

- Agricultural Economist
- Agriculture Teacher
- Cooperative Extension Service Worker

NATURAL RESOURCES

Forestry Job Family

- Forester
- Range Manager
- Logger
- Forester Technician
- Soil Conservationists

Mining Job Family

- Drilling Machine Operator
- Shuttle Car Operator
- Roof Bolter
- Loading Machine Operator
- Rock-Dust Machine Operator

Petroleum Job Family

- Refinery Operator
- Pumper
- Treater
- Tester
- Wax Molder
- Driller
- Formation-Testing Operator
- Oil-Pipe Inspector

OVERVIEW OF THE CBVE INSTRUCTIONAL SYSTEM FOR PRACTICAL ARTS

Overview of Program

The purpose of the Practical Arts Education program is to broaden the experiences of middle/junior high school students by providing them with an opportunity to become oriented to the world of work and explore a diversity of career goals in order that they may be better prepared to make decisions on their personal needs and future goals. The Practical Arts program consists of a series of career exploration classes based on the occupational clusters spread over a two-year period. A cruise through each occupational cluster shall include the implementation of three behavioral components or domains.

(A) Cognitive: Students shall survey or cruise the content of the occupational cluster. This survey should include the scope, levels, working conditions, entry requirements, duties performed, opportunities, and related jobs in the occupational cluster.

(B) Psychomotor: Students shall have in each cluster experiences of tasks that will be the same as or similar to those who work in the occupational cluster. These experiences or tasks shall be action oriented, vary with the students' interests, aptitudes, and abilities, and be at various levels of employment within a cluster.

(C) Affective: Students shall receive guidance and the opportunity to systematically appiy those knowledges and experiences within the cluster to his/her own interest and abilities, his/her present and future choices, and future occupational decisions and experiences.

The competency-based vocational education curriculum is specifically directed at the psychomotor, activities, experience, or tasks aspect of the Practical Arts program. Teachers are encouraged to augment their lesson plans with cognitive information about the occupational clusters from other sources. The curriuclum here will help specifically in the psychomotor aspect of the program.

Competency-Based Vocational Education

The purpose of this manual is to aid the instructor in implementing a competency-based instructional program. It is intended as a guide and resource for the teacher using CBVE materials. The materials in any occupational area have several common elements, particularly their purpose and their format, which will be discussed later.

Regardless of the delivery system used to implement it, CBVE is based on the concept of competencies. That is to say, it is an instructional system in which: (1) the competencies for specific occupations are built around tasks validated by incumbent workers; (2) instruction is designed around performance objectives based on the worker tasks; (3) students are held accountable for meeting the specified minimum standards of performance required for entry-level jobs.

These instructional materials have been developed by Kentucky teachers. They have attempted to provide relevant learning activities and performance objectives which include: (1) the skills (or tasks) which the student must learn; (2) the conditions under which the student must perform; and (3) the standard or level of achievement to which the student must perform.

The purpose of the Curriculum Unit (CBVE) is to develop and assist the implementation of competency-based instructional materials. The Unit is located at:

1910 Capital Plaza Tower
Frankfort, KY 40601

To facilitate the implementation of CBVE materials, a person has been identified in each vocational region as a CBVE Contact Person. Please address any problems or concerns about your CBVE program to your Regional Contact Person.

By the time you receive your CBVE materials, you should have attended a workshop for teachers implementing CBVE materials. The Inservice Education modules, which were distributed at the workshop, are your greatest source of suggestions for setting up and managing a CBVE program. For more detailed information, consult your inservice modules or your Regional Contact Person.

Using the Instructor's Manual

This Instructor's Manual is divided into two sections: introductory materials and Instructor's Guide to Learning Activities. The introductory materials include, among other things, the Program Master Sequence. It contains a listing of the task assignment sheet and slide/tape titles, code numbers, and stock numbers.

You can use the Program Master Sequence as a quick reference guide to the contents of the instructional program, as well as a checklist for insuring that all materials have been received. The code numbers and stock numbers serve as a guide to ordering additional materials.

The Instructor's Guide to Learning Activities is the heart of this manual, because it contains a brief listing of the contents of each task assignment sheet with suggestions for its use. It is suggested that you insert the corresponding task assignment sheet behind the Guide Sheets so you will have the complete program in one place.

Format is consistent throughout all CBVE programs in that the materials contain the same basic components:

Introduction - tells the student what he/she will learn and why it is important.

Objective - clearly states what the student is expected to know or do, under what conditions, and how well.

Learning Activities - a "road map" for the student to follow in going through the task assignment sheets; list the various activities the student will perform in learning the task.

Instructor's Final Checklist - tells the student and the instructor exactly what the student will be evaluated on in the check-out activity; the instructor uses this sheet to rate the student's performance.

Check-Out Activities - tells the student what he/she will be asked to do for the final test or performance.

The Instructor's Guide Sheets in this manual present the essential information in capsule form. In addition, they list: the recommended references and audio-visuals; attitudes and values to be developed; notes and suggestions for instruction; alternate activities for students; necessary tools and equipment; and space for teacher's notes.

The task assignment sheets are designed to be left intact. Students should be reminded not to write on any of the pages. In some cases, they will be required to obtain duplicates or sheets like the ones shown. These are often student self-checks. They can be filed in a folder and can be obtained as needed.

The Instructor's Final Checklist is another page that should not be written on. It should remain in the task assignment sheet although you may want to make additional copies of it to place in students' folders.

INSTRUCTOR'S GUIDE TO LEARNING ACTIVITIES

TAKING SOIL SAMPLES

OBJECTIVE

GIVEN an area to be sampled, a tool to obtain the sample, and an appropriate container,

TAKE SOIL SAMPLES OF THE AREA.

YOU will be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that soil samples can aid farmers in producing better crops.

CONTENTS OF MODULE

Instruction Sheets	Learning Activity Number
1. HOW TO TAKE SOIL SAMPLES	1
Instructor's Final Checklist	
TAKING SOIL SAMPLES	5

CHECK-OUT ACTIVITY

Choose an area of land and take eight soil samples.

SUGGESTED REFERENCES

Slide-tape presentation NP-1, "Taking Soil Samples," is available through the State Department of Education, Office of Research and Planning, Division of Materials and Curriculum, Capital Plaza Tower, Frankfort, KY 40601. $6.00.

LA	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students read the Instruction Sheet. Discuss the benefits in taking soil samples. Also discuss the tools and the procedure used in taking soil samples.	Instruction Sheet 1	
2	Have the students answer the questions orally or in writing.	"Taking Soil Samples" (Master Copy in this section)	
3	Demonstrate how to take a soil sample.	Plot of land Soil auger, soil tube, or flat-bladed spade Clean container	
4	Have students practice taking a soil sample. They may do this at home or at school.	See materials in Learning Activity 3.	
5	Have students take eight soil samples. You may want them to do this at home. Use the Instructor's Final Checklist to evaluate the student. (A parent may complete this if the student takes soil samples at home.)	See materials in Learning Activity 3. Instructor's Final Checklist	

TAKING SOIL SAMPLES

Below are five questions relating to taking soil samples. Answer the questions.

1. What devices may be used to obtain soil samples?
2. How deep should the sample be taken? Why?
3. What is meant by "random sampling"?
4. How many individual samples are sufficient?
5. How much of the collected soil is actually needed for the soil sample?

CORRECT ANSWERS:

1. Soil tube, soil auger, spade
2. 6"-8" deep. This area has most of the root growth.
3. Moving about a given area with no set pattern, trying to get a sampling that shows generally what the make-up of the entire plot is
4. 8-15 individual samples
5. 1/2 - 1 pint

PLANTING TREES AND SHRUBS

OBJECTIVES

1. GIVEN a balled and burlapped shrub or tree, spade, peat moss, water, and mulch,

   PLANT THE SHRUB OR TREE.

   YOU WILL be rated in accordance with the Instructor's Final Checklist.

OR

2. GIVEN a bare-rooted shrub or tree, pruners, spade, peat moss, water, and mulch,

   PLANT THE SHRUB OR TREE.

   YOU WILL be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that correct procedures must be followed when planting a tree or shrub in order to have a healthy plant.

CONTENTS

Instruction Sheets	Learning Activity Number
I HOW TO PLANT BALLED AND BURLAPPED SHRUBS AND TREES	1
II HOW TO PLANT BARE-ROOTED SHRUBS AND TREES	5
Instructor's Final Checklist	
PLANTING SHRUBS AND TREES	9

CHECK-OUT ACTIVITIES

Plant a balled and burlapped shrub or tree, OR a bare-rooted shrub or tree. Your teacher will provide the land area and the necessary tools and supplies.

SUGGESTED REFERENCES

Slide-tape presentation NP-12, "Planting Shrubs and Trees," is available from the Department of Education, Office of Research and Planning, Division of Curriculum and Materials, Capital Plaza Tower, Frankfort, KY 40601. $6.00.

Lewis, Forests and Forestry in Kentucky, available from the University of Kentucky, College of Agriculture, Cooperative Extension Service, Lexington, KY 40506.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	NOTE: Before beginning this task, it is suggested that you contact your local forestry service, which can furnish a multiple number of seedlings. This task deals with two types of trees: balled and burlap and bare-rooted. You may want to deal with only one type. You may want to consult with your principal as to where trees or shrubs can be planted to enhance the landscape around the school.	"Division of Forestry" (In this section) "Seedling Price List and Order Form" (In this section)	
1	Have students read Instruction Sheet I. Discuss the procedure for planting a balled and burlapped tree. Pay particular attention to the illustrations.	Instruction Sheet I	
2	Have students answer the questions orally or in writing.	"Planting Balled and Burlapped Shrubs or Trees" (Master Copy in this section)	
3	Demonstrate how to plant a balled and burlapped tree. (NOTE: You may want to take the class to a nursery where a worker could do the demonstration; or you may want to invite a nursery worker to talk with the class.)	Balled and burlapped tree or shrub Spade Peat moss Water Mulch Planting area	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHLR'S NOTES
4	You may remove the demonstration balled and burlapped tree and have small groups of students practice planting it. (This is for the sake of economy. Only one tree or shrub will be sacrificed.)	See materials listed in Learning Activity 3	
5	Have students read Instruction Sheet II. Discuss the procedure for planting a bare-rooted tree. Pay particular attention to the illustrations.	Instruction Sheet II	
6	Have students answer the questions orally or in writing.	"Planting Bare-Rooted Shrubs or Trees" (Master Copy in this section)	
7	Demonstrate how to plant a bare-rooted tree. (See NOTE in Learning Activity 3.)	Bare-rooted tree or shrub Pruners Spade Peat moss Water Mulch Planting area	
8	You may remove the demonstration bare-rooted tree and have small groups of students practice planting it.	See materials in Learning Activity 7	
9	Have students work in groups to plant either a balled and burlapped or a bare-rooted tree or shurb.	Balled and burlap tree or shrub: Spade Peat moss Water Mulch	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	Use the Instructor's Final Checklist to evaluate each group's performance.	Bare-rooted tree or shrub: Pruners Spade Peat moss Water Mulch Instructor's Final Checklist	

DIVISION OF FORESTRY

Natural Resources and Environmental Protection Cabinet
Department for Natural Resources

FOREST PLANTING

The Division of Forestry operates three nurseries where low-cost tree seedlings are grown and distributed to the state's farmers and timberland owners. This program encourages and promotes reforestation of approximately 1,000,000 acres of eroded, idle, and submarginal land; planting of farm windbreaks; and improvement of existing woodlands and critical areas.

Where possible, the Division of Forestry will transport the trees (500 and 1000 size bundles) to a central point in each county where buyers can receive them. Advance notice will be given each buyer as to the time and place of delivery. Seedling trees in 100 size bundles may be delivered by United Parcel Service to the purchaser.

Orders in some districts may be delivered to the landowner, as shipping schedules permit. In the event landowner lives near one of the three State nurseries (Gilbertsville, Dawson Springs, and West Liberty) buyer may call at nursery for trees that have been ordered previously through the District Offices.

Information concerning other species of seedlings and cuttings of hybrid poplar and superior cottonwood can be obtained from the local District Forester, Division of Forestry.

All seedlings are inspected prior to shipment. No adjustment or replacements will be made for losses or injuries unless reported when seedlings are delivered.

Fall deliveries-late November-early December; Spring deliveries-mid February-early April.

COUNTY GUIDE TO DISTRICT FORESTER'S OFFICE

NORTHEASTERN DISTRICT
Kentucky Division of Forestry
749 West First Street
Morehead, Kentucky 40351
Phone (606) 784-7504

Bath	Fleming	Montgomery
Boyd	Greenup	Morgan
Carter	Lewis	Nicholas
Clark	Mason	Robertson
Elliott	Menifee	Rowan

SOUTHEASTERN DISTRICT
Kentucky Division of Forestry
P.O. Box 130
Pineville, Kentucky 40977
Phone (606) 337-3011

Bell	Jackson	McCreary
Clay	Knox	Rockcastle
Harlan	Laurel	Whitley
	Leslie	

CENTRAL DISTRICT
Kentucky Division of Forestry
P.O. Box 663
Elizabethtown, Kentucky 42701
Phone (502) 769-1361

Allen	Breckinridge	Jefferson
Barren	Hancock	Nelson
Bullitt	Hardin	Simpson
Edmonson	Hart	Spencer
Grayson	Larue	Warren
	Meade	

EASTERN DISTRICT
Kentucky Division of Forestry
431 South Lake Drive
Prestonsburg, Kentucky 41653
Phone (606) 886-8562

Floyd	Lawrence	Martin
Johnson	Magoffin	Pike

BLUEGRASS DISTRICT
Kentucky Division of Forestry
P.O. Box 30
Stamping Ground, Kentucky 40379
Phone (502) 535-7741

Anderson	Gallatin	Oldham
Boone	Garrard	Owen
Bourbon	Grant	Pendleton
Bracken	Harrison	Scott
Campbell	Henry	Shelby
Carroll	Jessamine	Trimble
Fayette	Kenton	Woodford
Franklin	Madison	

GREEN RIVER DISTRICT
Kentucky Division of Forestry
P.O. Box 465
Madisonville, Kentucky 42431
Phone (502) 821-7434

Butler	Hopkins	Ohio
Christian	Logan	Todd
Daviess	McLean	Union
Henderson	Muhlenberg	Webster

KENTUCKY RIVER DISTRICT
Kentucky Division of Forestry
P.O. Box 702
Hazard, Kentucky 41701
Phone (606) 439-1385

Breathitt	Lee	Perry
Estill	Letcher	Powell
Knott	Owsley	Wolfe

SOUTH CENTRAL DISTRICT
Kentucky Division of Forestry
P.O. Box F
Campbellsville, Kentucky 42718
Phone (502) 465-5071

Adair	Green	Monroe
Boyle	Lincoln	Pulaski
Casey	Marion	Russell
Clinton	Mercer	Taylor
Cumberland	Metcalfe	Washington
		Wayne

WESTERN DISTRICT
Kentucky Division of Forestry
304 W. Walnut Street
Mayfield, Kentucky 42066
Phone (502) 247-3913

Ballard	Crittenden	Lyon
Caldwell	Fulton	Marshall
Calloway	Graves	McCracken
Carlisle	Hickman	Trigg
	Livingston	

Form N-2
Rev. 7-1-82

SEEDLING PRICE LIST AND ORDER FORM

Address to appropriate local District Office
(See Other Side)

Date of Order _____ District Order Number _____

Seedling order for:
( ) Fall _____
( ) Spring _____

_____ County
(County in which seedlings will be planted)

Method of Payment:
( ) Cash, Check, Money Order
( ) ASCS-ACP-CMS

Cash, Check, or Money Order, payment should accompany order, payable to "KENTUCKY STATE TREASURER"

Species Ordered	Number	Unit Cost	Cost
			Total

Deliver: ( ) To landowner; ( ) Picked up at Central Point; ( ) Will call at _____ Nursery

_____ _____
(Delivery instructions, if different from landowner's address) (Signature of landowner or representative)

_____
Address

_____ _____
(Phone Number) (Zip Code)

(DO NOT DETACH)

For more specific information on species selection, spacing, and planning, contact your District Forestry Office. Office addresses are on the reverse side.

Species	Age	Length of Top	Price Per Bundle Size 100	500	1000
Loblolly Pine	1 yr.	6"-14"	$12.00	$25.00	$ 40.00
Shortleaf Pine	1 yr.	6"-12"	12.00	25.00	40.00
White Pine	2 yr.	6"-12"	12.00	28.00	45.00
Virginia Pine	1 yr.	6"-12"	12.00	25.00	40.00
Scotch Pine	2 yr.	6"-12"	12.00	28.00	45.00
Black Locust	1 yr.	8"-16"	12.00	25.00	40.00
White Ash	1 yr.	8"-16"	12.00	25.00	40.00
Cottonwood	1 yr.	8"-20"	12.00	25.00	40.00
Sycamore	1 yr.	8"-20"	12.00	25.00	40.00
Yellow Poplar	1 yr.	6"-16"	12.00	28.00	45.00
Black Walnut	1 yr.	8"-20"	17.00	70.00	125.00
White Oak	1 yr.	6"-20"	12.00	30.00	50.00
Chinese Chestnut	1 yr.	6"-12"	17.00	70.00	125.00
Black Alder	1 yr.	6"-12"	12.00	25.00	40.00
Autumn Olive	1 yr.	6"-12"	12.00	25.00	40.00
Bicolor Lespedeza	1 yr.	6"-12"	12.00	25.00	40.00

*A special wildlife packet containing a mixture of seedlings suitable for a wildlife planting is available. It contains 100 seedlings and costs $17.00 including delivery by United Parcel to the purchaser.

Order seedling trees from the Kentucky Division of Forestry District Office (addresses on reverse side). Additional order blanks are available at Soil Conservation Service, ASCS, your County Agent, and Division of Forestry Offices.

PLANTING BALLED AND BURLAPPED SHRUBS OR TREES

Answer the questions below.

1. How large should the hole be dug for a balled and burlapped shrub or tree?

2. The burlap should be removed from the soil ball before the tree or shrub is planted. True or False.

3. After the hole is filled 1/2 full with soil, how much water is added?

4. Why is a saucer made around the tree?

5. Why is mulch added to the surface of the watering basin?

6. How long should attention be given to the watering needs of the plant?

PLANTING BALLED AND BURLAPPED SHRUBS OR TREES

ANSWERS

1. 12" deeper than root ball and twice as wide.
2. False. The burlap can be left on the root ball where it will gradually decompose in the soil.
3. Fill the hole with water.
4. To form a water basin.
5. To conserve moisture and lessen temperature fluctuation.
6. Throughout the first growing season.

PLANTING BARE-ROOTED SHRUBS OR TREES

Answer the questions below.

1. Small evergreen shrubs or trees can be planted bare-rooted if they are planted soon after they are dug. True or False.

2. Where should the pruning cut be made on broken or damaged roots?

3. The hole for a bare-rooted shrub or tree should be _____ wider then the root spread and _____ deeper than the length of the root system.

4. What soil mixture should be placed in the hole with the shrub or tree?

5. What is the size of deciduous trees that are usually transplanted bare-rooted?

PLANTING BARE-ROOTED SHRUBS OR TREES

ANSWERS

1. True.
2. Just behind the break.
3. 12", 6".
4. One part peat and two parts soil.
5. 2" in diameter or less.

POTTING PLANTS

OBJECTIVE

GIVEN a plant, soil mixture, crushed rock, water, and a selection of pots, POT THE PLANT.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize the importance of choosing the correct size pot when potting plants.

CONTENTS

Instruction Sheets	Learning Activity Number
I HOW TO SELECT PLANT POTS	1
II HOW TO POT PLANTS	3
Instructor's Final Checklist	
POTTING PLANTS	7

CHECK-OUT ACTIVITY

You will be provided the necessary supplies and a plant. Choose the proper size pot and pot your plant.

LA	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students read Instruction Sheet I. Discuss the information. You may want to show the class different types and sizes of pots; or you may ask students to bring a plant pot from home.	Instruction Sheet I	
2	Students may write the answers to the questions or discuss them orally.	"Selecting Plant Pots" (Master Copy in this section)	
3	Have students read Instruction Sheet II. Discuss the information.	Instruction Sheet II	
4	Prepare a display of various sizes of potted plants. (Students may bring them from home.) Let students analyze each one for: --Proper size pot --Placement of plant --Depth of soil to the rim of the pot	Variety of potted plants	
5	Demonstrate how to pot a plant. (A pre-sterilized soil mixture is more convenient to use.)	Plant Pot Sterilized soil mixture Crushed rock Water	
6	Let small groups of students work together to practice potting plants.	Supplies listed above	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
7	To Check-Out on this task, students must pot a plant. You may use one of three methods. --Have students work in small groups in class. --Have students work individually in class. --Have students work in the school greenhouse or at home. Use the Instructor's Final Checklist to evaluate each student's performance.	Supplies listed on the preceding page Instructor's Final Checklist	

SELECTING PLANT POTS

Answer the following questions:

1. Name four reasons why plants may be potted.
2. Name three things you must consider when selecting a pot size.
3. How do you know when you have selected the correct pot size?
4. What do you accomplish by providing extra space for roots to grow?

SELECTING PLANT POTS

ANSWERS

1. (a) Ease of moving, (b) ease of root pruning, (c) allows tender plants to be moved indoors, (d) more attractive.

2. (a) Maturity size, (b) mature foliage growth, (c) mature root growth.

3. (a) 4" from side of pot to plant roots, (b) 6" from bottom of pot to bottom of plant roots, (c) 3" from top of container to point where plant stem enters soil.

4. Provides a place for roots to expand and grow, making it stronger and more attractive.

PRUNING SHRUBS AND HEDGES FOR SHAPING

OBJECTIVES

1. GIVEN a shrub, pruning shears, and pruning wound paint or sealer,
   PRUNE THE SHRUB FOR SHAPING.
   YOU WILL be rated in accordance with the Instructor's Final Checklist.
2. GIVEN a hedge, electric or hand shears, pruning knife, and pruning shears,
   PRUNE THE HEDGE FOR SHAPING.
   YOU WILL be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize the importance of pruning shrubs and hedges so that air and light can penetrate all areas.

CONTENTS

Instruction Sheets	Learning Activity Number
I HOW TO PRUNE A SHRUB	1
II HOW TO PRUNE A HEDGE	4

Instructor's Final Checklist

PRUNING SHRUBS AND HEDGES FOR SHAPING	7

CHECK-OUT ACTIVITIES

1. You will be provided a shrub and the necessary supplies. Prune the shrub for shaping.

AND/OR

2. You will be provided a hedge and the necessary tools. Prune the hedge for shaping.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	NOTE: Before beginning this task, you may want to make arrangements with your school principal to prune shrubs and/or hedges on the school grounds; or you may want to make arrangements for your students to work with high school or vocational school horticulture students. NOTE: You may decide to have the students prune either a shrub or a hedge.		
1	Have the students read Instruction Sheet I. Discuss the shrubs and how they should be pruned for shaping.	Instruction Sheet I	
2	Demonstrate how to prune shrub to its natural shape. (NOTE: You may arrange for the class to visit a nursery and watch a pruning demonstration. Or you may invite a horticulture student to present a demonstration.)	Shrub Pruning shears Pruning wound paint or sealer	
3	Let students work in small groups to practice pruning a shrub, or have each student practice at home.	Shrubs Pruning shears Pruning wound paint or sealer	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
4	Have students read Instruction Sheet II. Discuss formal and informal shaping, and the procedures for pruning a hedge.	Instruction Sheet II	
5	Demonstrate how to trim a formal and an informal hedge. (See the NOTE Learning Activity 2.)	Formal and informal hedge Electric or hand shears Pruning knife Pruning shears	
6	Let students practice pruning a portion of a hedge at school, or have each student practice at home.	See materials listed above	
7	Have students prune a shrub and/or a hedge. They may do it at school or at home. Use the Instructor's Final Checklist to evaluate each student's work. A parent may complete it if the student did the activity at home.	Shrubs Pruning shears Pruning wound paint and sealer Hedges Electric or hand shears Pruning	

PREPARING A LAWN SEEDBED

OBJECTIVE

Given ground limestone, fertilizer, rake, and lawn area,

PREPARE A SEEDBED FOR THE LAW AREA.

THE SEEDBED should be free of debris, properly tilled, raked smooth, with the plant food applied uniformly and tilled into the soil.

ATTITUDES AND VALUES TO BE DEVELOPED IN THIS MODULE (AFFECTIVE DOMAIN):

--Students will realize the importance of having the soil tested and analyzed before preparing a lawn seedbed

CONTENTS OF MODULE

	Learning Activity Number
Instruction Sheet	
1. HOW TO PREPARE A LAWN SEEDBED.....	2
Instructor's Final Checklist	
PREPARING A LAWN SEEDBED.....	6

CHECK-OUT ACTIVITY

You will be provided the necessary supplies. Prepare a lawn seedbed.

PREPARING A LAWN SEEDBED

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Identify the lawn area to be used for this task. Take a soil sample and have it analyzed. Describe the soil analysis to the class.	Lawn area Soil sample Soil analysis report	
2	Have the class read and discuss Instruction Sheet I.	Instruction Sheet I	
3	Have the class figure the amounts of ground limestone and fertilizer that will be needed to prepare the seedbed.	Soil analysis report Instruction Sheet I	
4	Show the class how to prepare a lawn seedbed.	Ground limestone Fertilizer Rake Lawn area	
5	Let the students work in small groups to practice preparing a small area for a seedbed. You may want them to practice at home.	See materials listed above	
6	Divide the class into small groups. Let each group prepare a seedbed in a small portion of the lawn area you identified in Learning Activity 1. When the groups have finished, there will be several seedbeds in the area. Use the Instructor's Final Checklist to evaluate each seedbed.	Materials listed in Learning Activity 4. Instructor's Final Checklist	

SOWING LAWNS

OBJECTIVE

Given a lawn seedbed, grass seed, hand seeder, mulch, pitchfork, lawn roller, string and stakes, and water,

SOW THE LAWN.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED IN THIS MODULE (AFFECTIVE DOMAIN):

--Students will realize that in order to have a well established lawn the proper sowing methods must be followed.

CONTENTS OF MODULE

	Learning Activity Number
Instruction Sheet	
1. HOW TO SOW A LAWN.....	1
Instructor's Final Checklist	
SOWING LAWNS.....	5

CHECK-OUT ACTIVITY

You will be provided the necessary equipment and supplies. Sow a portion of the seedbed you prepared in Task Assignment Sheet PA-AG-5.

SOWING LAWNS

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	NOTE: The seedbeds prepared in the previous Task Assignment Sheet may be used for this task.	Seedbed Grass seed	
	NOTE: Before beginning this task, you will need to obtain the appropriate seed mixture and figure the correct amount needed for each seedbed.		
1	Have the class read Instruction Sheet I. Discuss the steps in sowing a lawn.	Instruction Sheet I	
2	Show the class how to set the seeder to apply one-half the recommended rate. Also demonstrate how to open the seeding gate and to operate the seeder in a smooth, continuous motion. Divide the class into small groups, and let each group practice setting and operating the seeder.	Seeder	
3	Demonstrate how to sow a lawn. (NOTE: You may decide to invite a landscaper or horticulture student to do the demonstration.)	Small lawn area Grass seed Seeder Mulch Pitchfork Lawn roller String and stakes Water	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
4	Let the students practice in small groups, sowing a small plot of ground. (You may prefer that they practice at home.)	See equipment and supplies listed in Learning Activity 3.	
5	Let each group sow the seedbed it previously prepared. Use the Instructor's Final Checklist to evaluate the students' performance.	Seedbeds prepared in Task Assignment Sheet PA-AG-5 Grass seed Seeder Mulch Pitchfork Lawn roller String and stakes Water Instructor's Final Checklist	

CLEANING A SMALL ENGINE

OBJECTIVE

Given a small engine, degreaser, and the necessary tools,

DEMONSTRATE HOW TO CLEAN THE ENGINE.

YOU will be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED IN THIS MODULE (AFFECTIVE DOMAIN):

--Students will become aware of the benefits of keeping an engine clean.

CONTENTS OF MODULE

	Learning Activity Number
Instruction Sheet	
I. HOW TO CLEAN A SMALL ENGINE.....	2
Instructor's Final Checklist	
CLEANING A SMALL ENGINE.....	5

CHECK-OUT ACTIVITY

You will be provided a small engine, degreaser, and the necessary tools. Demonstrate how to clean the engine.

SUGGESTED REFERENCES

AAVIM, Small Engines, "Cleaning Small Engines," Volume 1, available from the State Department of Education, Office of Research and Planning, Capital Plaza Tower, Frankfort, KY 40601; $4.

CLEANING A SMALL ENGINE

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	NOTE: This task requires the use of a small engine. A lawn mower engine is appropriate.	Small engine	
NOTE:	You may approach this task by: --Providing several small engines in the school shop. --Having several students bring equipment with small engines from home. --Using one small engine and letting students demonstrate how it should be cleaned, but not actually cleaning it.		
1	Explain what may happen to a dirty engine: --It overheats. --Dirt gets inside the engine. --Rubber parts soften. --Damage of parts goes unnoticed.		
2	Have the students read Instruction Sheet I. Discuss the steps, pointing out the parts of the engine as they are introduced in the reading.	Instruction Sheet I, SMALL ENGINE	

CLEANING A SMALL ENGINE

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
3	Demonstrate how to clean a small engine: --outside of the crankcase and accessories --the cooling system --the exhaust system Stress Safety: --Never use gasoline to clean an engine. --Be sure to read the instructions on the degreaser. It may be flammable and dangerous to use in a closed building or near a flame.	Small engine Screwdriver Socket set Open-end wrenches Nut drivers Wire brush Paint brush Water hose with nozzle Wooden scraper Degreaser	
4	Let the students work in small groups to practice cleaning an engine.	Tools, equipment, and supplies listed above.	
5	Have each student actually clean or demonstrate how to clean a small engine. Use the Instructor's Final Checklist to evaluate each student's performance.	Tools, equipment, and supplies listed in Learning Activity 3. Instructor's Final Checklist	

OPERATING A SMALL ENGINE

OBJECTIVE

Given a piece of small engine powered equipment and the operator's manual,

START, OPERATE, AND STOP THE ENGINE.

YOU SHOULD start, adjust the speed and load, and stop the engine according to the instructions in the operator's manual.

ATTITUDES AND VALUES TO BE DEVELOPED IN THIS MODULE (AFFECTIVE DOMAIN):

--The students will realize that in order for a small engine to operate efficiently and safely, it must be started, operated, and stopped properly.

CONTENTS OF MODULE

	Learning Activity Number
Instructor's Final Checklist	
OPERATING A SMALL ENGINE.....	4

CHECK-OUT ACTIVITY

Start, operate, and stop a small engine. Follow the directions in the operator's manual.

SUGGESTED REFERENCES

AAVIM, Small Engines, Volume 1, available from the State Department of Education, Office of Research and Planning, Capital Plaza Tower, Frankfort, KY 40601; $4.

OPERATING A SMALL ENGINE

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	(NOTE: To perform this task, the students need a small engine powered piece of equipment such as a lawn mower.)	Small engine powered equipment.	
1	Give a lecture on safety precautions that must be observed when operating small engines; e.g., dressing properly, dangers of carbon monoxide, and watching for children and pets. Have the students make a list of precautions to be taken when starting, operating, and stopping a small engine.		
2	Have students read about starting, operating, and stopping the engine.	Operator's Manual Small Engines, Vol. 1	
3	Let the students practice starting, operating, and stopping the engine. (You may want them to do this at home.)	Small engine powered equipment Operator's Manual	

OPERATING A SMALL ENGINE

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
4	Have the students start, operate, and stop the engine they are using. Use the Instructor's Final Checklist to evaluate each student's performance. (NOTE: If a student performs this task at home, a family member may complete the checklist.)	Small engine powered equipment Operator's Manual Instructor's Final Checklist	

IDENTIFYING BREEDS OF BEEF CATTLE

OBJECTIVE

Given a list of beef cattle features and of beef cattle breeds,

MATCH EACH FEATURE TO THE PROPER BREED

YOU should do this with 100% accuracy.

ATTITUDES AND VALUES TO BE DEVELOPED IN THIS MODULE (AFFECTIVE DOMAIN):

--Students will realize that each breed of beef cattle has special characteristics. Cattle producers should be familiar with these characteristics and choose the breed of cattle that best suits the producers' needs.

CONTENTS OF MODULE

	Learning Activity Number
Instructor's Final Checklist	
IDENTIFYING BREEDS OF BEEF CATTLE.....	4

CHECK-OUT ACTIVITY

Your teacher will provide a list of beef cattle features and beef cattle breeds. Match each feature to the breed.

SUGGESTED REFERENCE

Slide-tape presentation LP-22, "Identifying Beef Breeds" is available from the State Department of Education, Office of Research and Planning, Capital Plaza Tower, Frankfort, KY 40601; $6.

IDENTIFYING BREEDS OF BEEF CATTLE

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students look at pictures of various breeds of beef cattle, particularly hereford, angus, simmental, and charolais.	Encyclopedia Brittanica Slide-tape presentation, "Identifying Beef Breeds" Farm/cattle journals	
2	Have students write a report on the history of one of these breeds: hereford, angus, simmental, charolais.	Encyclopedia	
3	Let students contact their local extension agent or FFA member who can identify where the breeds of beef cattle can be found in their area. They may arrange to visit the place and take pictures or write descriptions of the animals. or Have them interview someone who can describe the physical features of one of the breeds of cattle.	Optional Reference: "Features of Beef Cattle" (Master Copy in this section)	
4	Have each student complete the CHECK-OUT ACTIVITY. Use the Answer Key to check his/her answers. Use the Instructor's Final Checklist to evaluate each student.	CHECK-OUT ACTIVITY Sheet Answer Key (Master copy in this section) Instructor's Final Checklist	

CHECK-OUT ACTIVITY

FEATURES OF BEEF CATTLE

Hereford

Hereford cattle were imported into the United States from England in 1817 by Henry Clay of Kentucky. These cattle were imported in larger numbers between 1850 and 1890. The breed's physical characteristics include the following:

--The body color is red with a white face.

-- A white color is present on the flank, underline, breast, switch, and below the hock and knees on all four legs.

--The body length is moderate to long.

--The legs have adequate length.

--The body is trim and smooth.

--Valuable cuts are well developed.

--Hereford are highly regarded for foraging ability.

--They possess vigor.

Angus

Angus cattle were imported from Scotland in the late 1800s. This breed is also known as Aberdeen-Angus. The breed's physical characteristics include the following:

--The body color is black.

-- There is an absence of white, except to a small extent on the underline behind the navel.

--They are polled (absence of horns).

--The body form is smooth and medium in size.

--The body has adequate length and is well muscled.

--They are believed to have shown resistance to some eye disease.

CHECK-OUT ACTIVITY, (page 2)

Charolais

The charolais breed originated in France around the mid-1700s. It was not until the mid-1930s that this breed was imported into the United States. Charolais became most prominent in the southwest and Florida. The breed's physical characteristics include the following:

--The body is large and heavily muscled.

--The body color is light cream.

--The body form lacks smoothness.

--They sometimes have problems during calving.

--They are used extensively for crossbreeding purposes.

Simmental

Simmentals originated in Switzerland and were imported into the United States in 1968. Simmentals are used extensively in crossbreeding programs in the United States. The breed's physical characteristics include the following:

--The body color is light red or creamy with white faces.

--The body color has white markings over the shoulder.

--They are adequate producers of milk.

--The body form is smooth with adequate muscling and size.

--They have a manageable disposition.

--Mature bulls will average 2,400 pounds.

--Mature cows will average 1,700 pounds.

CHECK-OUT ACTIVITY

IDENTIFYING BREEDS OF BEEF CATTLE

Number your own paper from 1-4. Match the correct beef breed with the correct feature. Write the correct breed beside the number on your paper.

Beef Breeds - Angus, Hereford, Charolais, Simmental

Cattle Features:

1. The animal has a white face and red colored body with white markings. The body is trim and smooth. It is an excellent forager. It was imported into the United States by Henry Clay of Kentucky.

2. The animal has a creamy or light red colored body with white markings. It has a white face. The body is smooth and muscled. It began in Switzerland.

3. The animal is colored black. Its body form is smooth and well muscled. It has no horns. It was imported into the United States from Scotland.

4. The animal is light cream colored. The body is large and heavily muscled. It began in France.

CHECK-OUT ACTIVITY

IDENTIFYING BREEDS OF BEEF CATTLE

ANSWER KEY

1. Hereford
2. Simmental
3. Angus
4. Charolais

IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE

OBJECTIVE

GIVEN pictures of ten parts of an underground coal mine,

IDENTIFY EACH PART.

YOU should identify at least nine parts correctly.

ATTITUDES AND VALUES TO BE DEVELOPED IN THIS MODULE (AFFECTIVE DOMAIN):

--Students will understand the importance of careful and exact planning in developing an underground coal mine.

CONTENTS OF MODULE

	Learning Activity Number
Instruction Sheet	
I. PARTS OF AN UNDERGROUND COAL MINE.....	1
Instructor's Final Checklist	
IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE.....	3

CHECK-OUT ACTIVITY

Your teacher will provide pictures of ten parts of an underground coal mine. Write the name of each part.

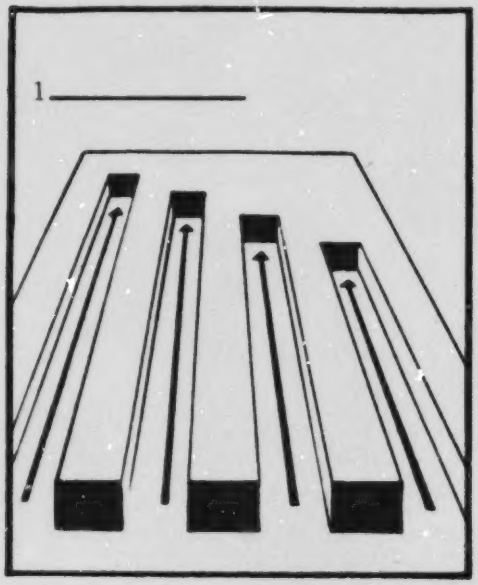
IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE

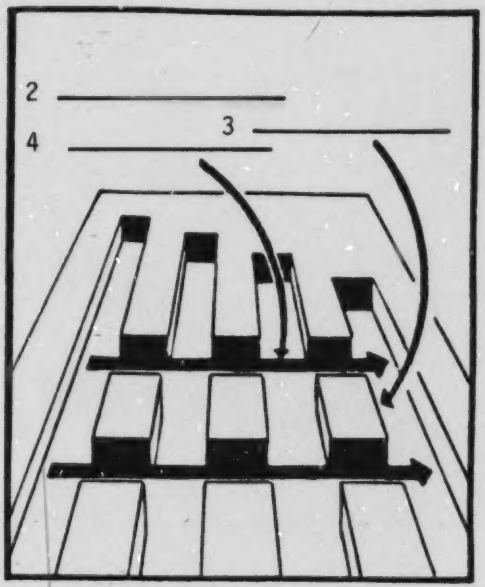
LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students examine the drawings of the ten major parts of an underground coal mine. The vocabulary describes the parts shown. Discuss each part illustrated.	Instruction Sheet I Vocabulary	
2	If there is a simulated coal mine in your area, arrange for the class to visit. Have the students write a description of each part of the mine. or Let students build a model of an underground mine.	Simulated underground coal mine or Materials to build a model underground mine	
3	Have each student complete the CHECK-OUT ACTIVITY. Use the Answer Key to check his/her answers. Use the Instructor's Final Checklist to evaluate each student's performance.	CHECK-OUT ACTIVITY SHEET Answer Key (Master copy in this section) Instructor's Final Checklist	

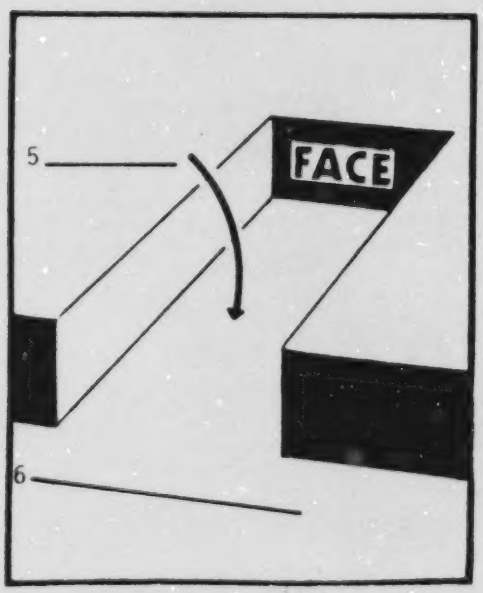
CHECK-OUT ACTIVITY

IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE

Number your own paper from 1 to 10. By each number write the name of each part of an underground mine. DO NOT WRITE ON THIS PAGE.







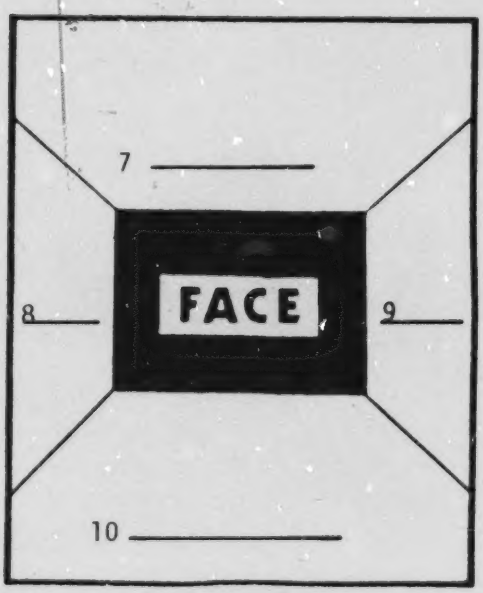
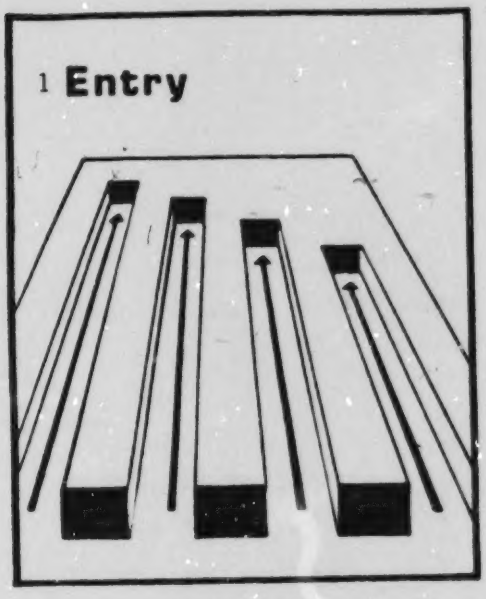
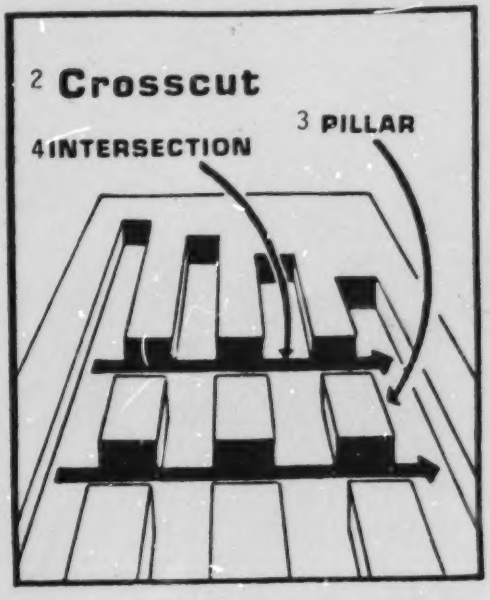


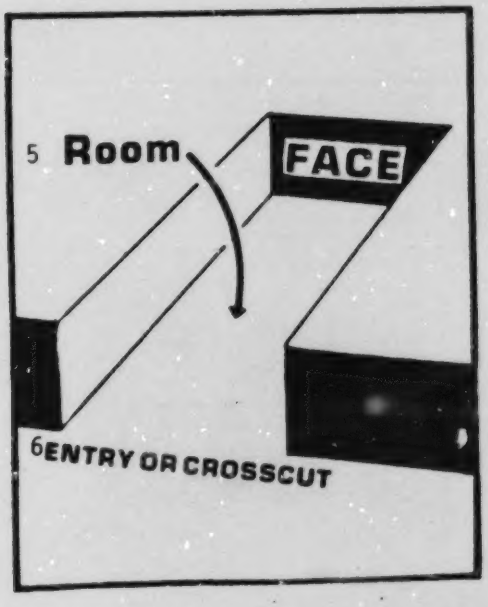
Illustration reprinted from Kentucky Mine Safety Training Program, Trainer Handbook (Underground), Kentucky Department of Education (Frankfort, n.d.).

CHECK-OUT ACTIVITY

IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE







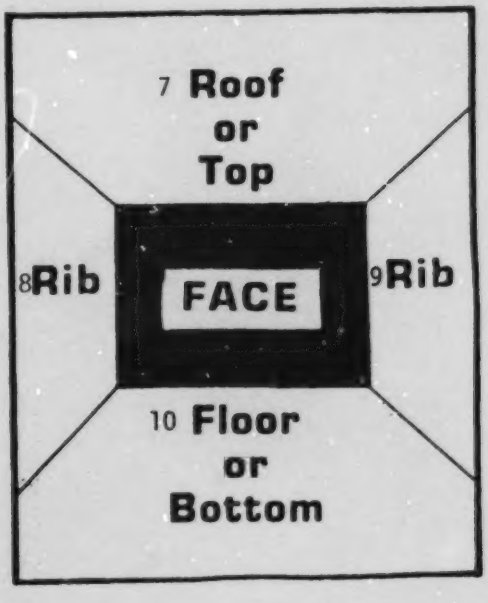


Illustration reprinted from Kentucky Mine Safety Training Program, Trainer Handbook (Underground), Kentucky Department of Education (Frankfort, n.d.).

IDENTIFYING BASIC MINING EQUIPMENT

OBJECTIVES

GIVEN drawings of nine pieces of basic mining equipment,

IDENTIFY EACH PIECE OF EQUIPMENT AND EXPLAIN HOW IT IS USED.

YOU should correctly identify and explain the use of at least eight pieces of equipment.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that the type of mining equipment used depends on the method of mining.

CONTENTS OF MODULE

Instruction Sheet	Learning Activity Number
1. BASIC MINING EQUIPMENT	1

Instructor's Final Checklist

IDENTIFYING BASIC MINING EQUIPMENT	4

CHECK-OUT ACTIVITY

Your teacher will provide drawings of basic mining equipment. Name each piece of equipment and explain how it is used.

IDENTIFYING BASIC MINING EQUIPMENT

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students study each piece of equipment illustrated.	Instruction Sheet I	
2	Explain the use of each piece of equipment. (See the Answer Key for the Check-Out Activity.)		
3	Make transparencies of the Check-Out Activity Sheets. Have the class identify the pieces of equipment as they are projected on the screen	Check-Out Activity Sheets (Master Copy in this section) Transparencies Overhead projector Screen	
4	Duplicate a set of Check-Out Activity Sheets for each student. Have them name each piece of equipment and explain its use. Use the Instructor's Final Checklist to evaluate each student.	Check-Out Activity Sheets Answer Key Instructor's Final Checklist	

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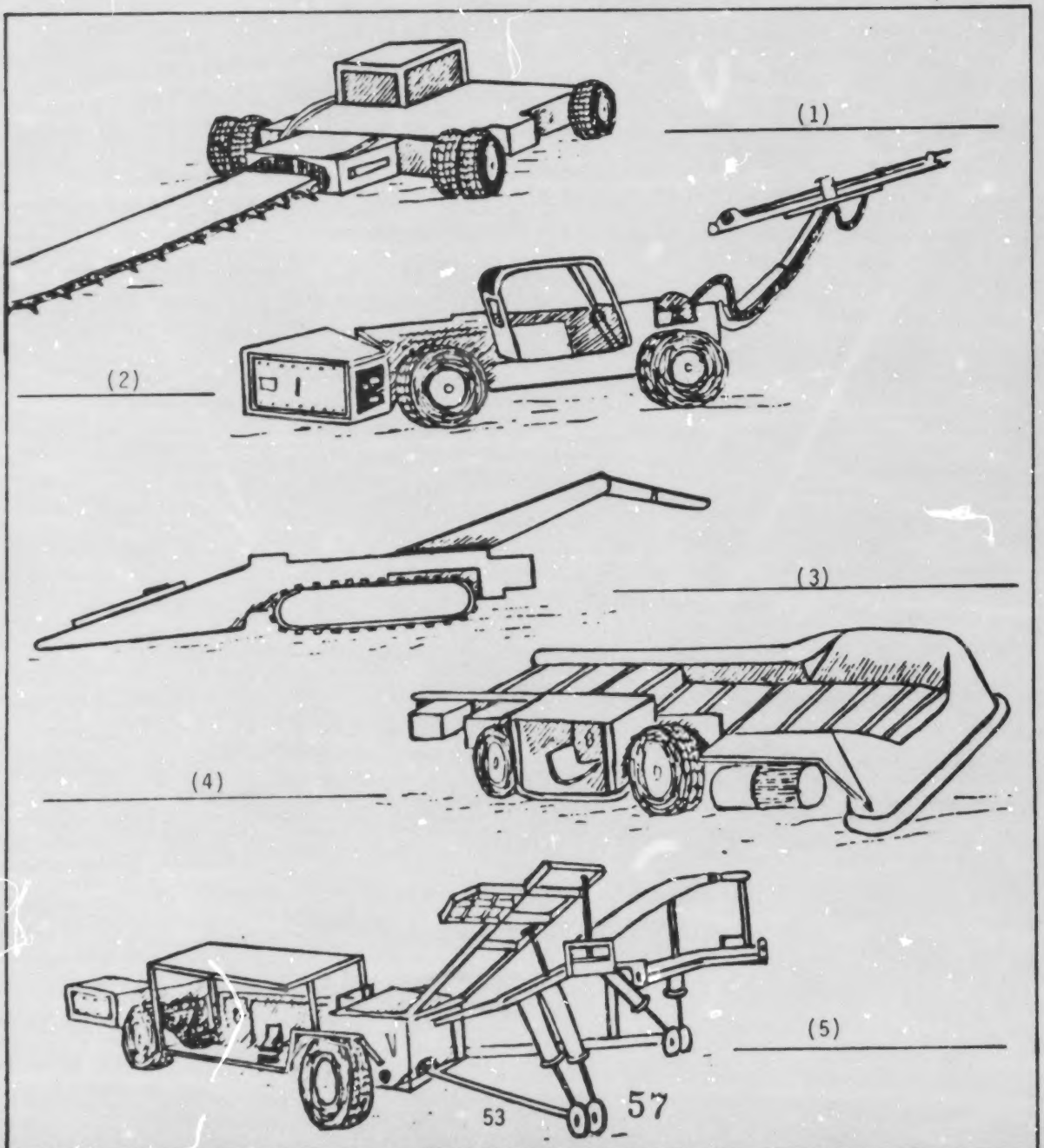
CHECK-OUT ACTIVITY

IDENTIFYING BASIC MINING EQUIPMENT

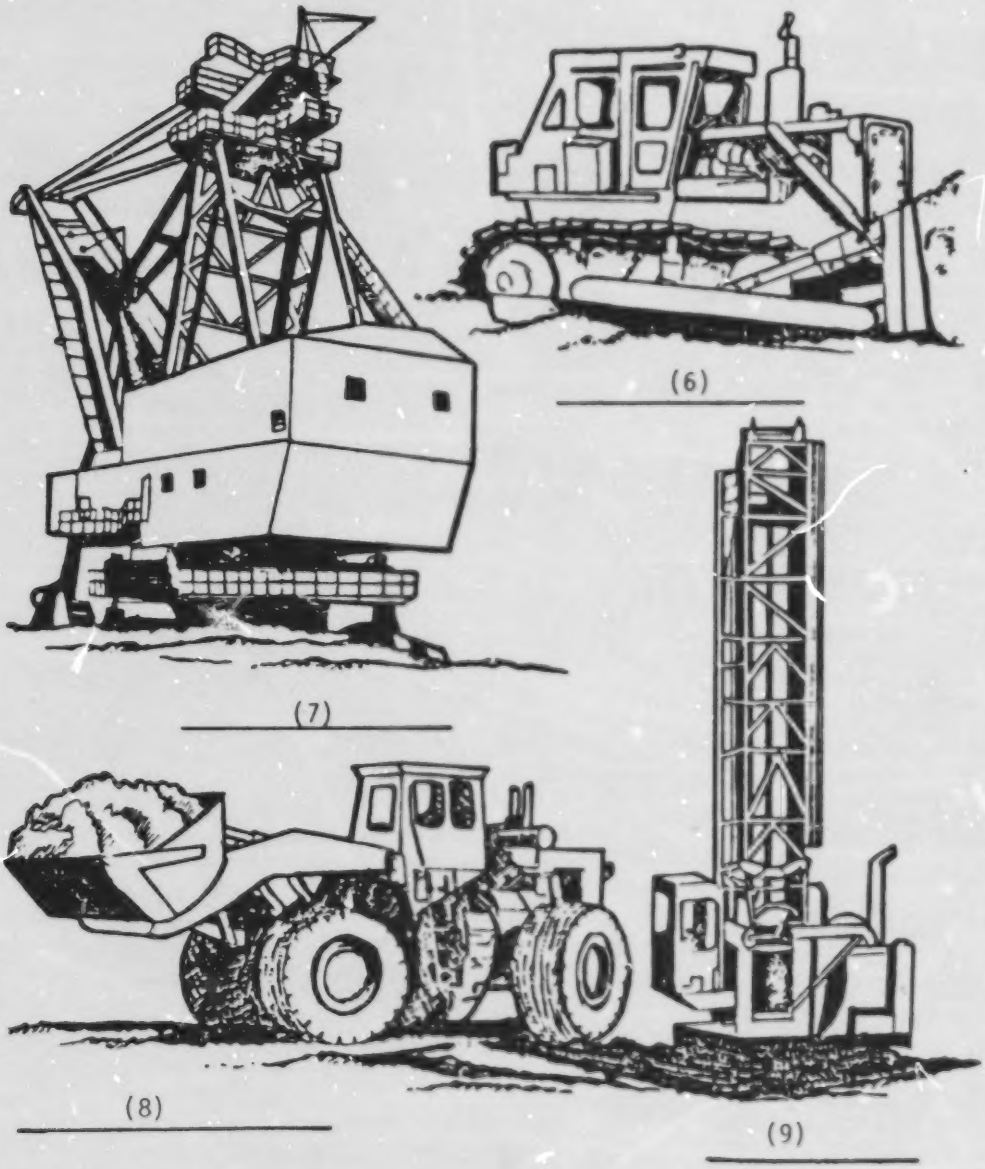
Number your own paper from 1-9. Write the name of each piece of equipment and explain its use. Do not write on this page.

Conventional Mining Equipment



CHECK-OUT ACTIVITY, (page 2)

SURFACE MINING EQUIPMENT



(6) _____

(7) _____

(8) _____

(9) _____

Illustration reprinted from Kentucky Mine Safety Training Program, Trainer Handbook (Surface), Kentucky Department of Education (Frankfort, n.d.).

CHECK-OUT ACTIVITY

IDENTIFYING BASIC MINING EQUIPMENT

(ANSWERS)

1. Cutting machine - undercuts the coal so that it will shoot out when it is blasted.
2. Face drill - drills holes for blasting the coal.
3. Loading machine - loads the loose coal into the shuttle car.
4. Shuttle car - carries the coal out of the mine.
5. Roof bolter - drills the holes and installs the bolts that support the roof.
6. Power shovel - dips up the coal and/or removes the rock and dirt from the coal.
7. Bulldozer - cleans off the rock and dirt down to the coal.
8. Front-end loader - picks up the extracted coal and loads it into trucks.
9. Drill - drills and blasts the rock and dirt down to the coal.

CLASSIFYING ROCKS

OBJECTIVE

GIVEN a rock classification worksheet,

EXPLORE AND CLASSIFY ROCKS.

YOU should explore at least five rocks and complete the worksheet for each one.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will understand that pressure and temperature are both factors in the formation of rocks.
--Students will realize that rocks are simply a combination of minerals.

CONTENTS OF MODULE

Instructor's Final Checklist	Learning Activity Number
CLASSIFYING ROCKS	6

CHECK-OUT ACTIVITY

Your teacher will provide a rock classification worksheet. Explore at least five rocks and complete the worksheet for each one. If possible, explore one rock that is too large to remove from its place.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Explain that minerals are elements or combination of elements. For example, gold is an element and a mineral. It is not combined with anything else. On the other hand, quartz is a combination of two elements-silicone and oxygen. Rocks are a combination of minerals. Have students list minerals that are found in this state.		
2	Explain that one of the physical characteristics that is unique to minerals is crystal formation. Have student grow crystals following the instructions. Give them an opportunity to describe some of their crystals in class.	"Instructions for Growing Crystals" (Master Copy in this section)	
3	Let students look at sand, salt, and sugar under the microscope and draw the predominate shape for each.	Microscope Sand Salt Sugar	
4	Have students bring rocks to class. Demonstrate how to classify one of the rocks.	"Criteria for Classifying Rocks" (Master Copy in this section) Rocks	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
5	Have small groups of students choose a rock and classify it according to the criteria. Let each group share its findings.	Rocks "Criteria for Classifying Rocks"	
6	Provide each student a copy of the rock classification worksheet. Have him/her explore at least five rocks outside of school and complete the worksheet for each one. Use the Instructor's Final Checklist to evaluate each student's performance.	Check-Out Activity Sheet (Master Copy in this section) Instructor's Final Checklist	

INSTRUCTIONS FOR GROWING CRYSTALS*

Materials Needed:

1/4 cup salt
1/4 cup bluing
1/4 cup water
1 tablespoon ammonia

Procedure:

Mix the above together and pour over crumbled paper towels in a pie pan. Add small amounts of food coloring and the colors will show up in the crystals. Crystals will start to form in about one hour and will continue for about five hours.

*Taken from Natural Resources and Career Awareness, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402

CRITERIA FOR CLASSIFYING ROCKS*

Check the following characteristics when classifying rocks:

Layering:

If a rock is banded or layered, it is not igneous.

If the rock is layered and the layers are very thick, one to two feet, it is probably a sedimentary rock.

The layering in metamorphic rock is usually thin and each layer represents a particular mineral. Often light and dark colored minerals alternate with each other.

After a rock has been put into a general classificaition, further investigation is necessary in order to give the rock a particular identification.

Hardness:

All rocks and minerals have a particular degree of hardness as measured on the hardness scale of 1-10. Number 1 is talc and Number 10 is diamond. Commercial hardness scales are available but not necessary for the elementary exploration of rocks. The following guide can be used:

Hardness	Item
2	Fingernail
3	Copper penny
5	Nail
5-1/2	Window glass
6-1/2	Steel file

Color of Streak:

Very often the exterior color of a rock is misleading. It may have oxides on it that hide the true color of the minerals that make it up. The streak is uncovered by rubbing a piece of rock on a white unglazed tile. (The back of any piece of bathroom tile will serve this purpose very well.)

Texture:

Have the children feel the rock. Is it rough or smooth?

Luster:

There are two divisions of luster that are easily observable. Metallic (shiny) or nonmetallic (dull).

*Ibid.

Crystal Shape:

Some rocks will have crystals that are large enough to recognize without a magnifying lens, while some will require very heavy magnification to see the crystals.

Effervescence:

Some rocks will react to acid dropped on them by giving off bubbles. This is especially true of the carbonate minerals. Vinegar can be used as the acid.

CHECK-OUT ACTIVITY

CLASSIFYING ROCKS

No.	Color Outside	Color Streak	Texture	Hardness	Luster	Crystal Shape	Vinegar Test	Classification: Igneous, Metamorphic or Sedimentary

IDENTIFYING PARTS OF A TREE

OBJECTIVE

GIVEN a drawing of a tree,

IDENTIFY EACH PART OF THE TREE.

YOU should identify at least nine of the parts correctly.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that trees provide many different kinds of products; they also provide the environment for soil and water conservation, for wildlife, for recreation, and for natural beauty. Therefore, citizens should be concerned about the care and wise use of our forests.

CONTENTS

Instruction Sheet	Learning Activity Number
1 PARTS OF A TREE	1
Instructor's Final Checklist	
IDENTIFYING PARTS OF A TREE	4

CHECK-OUT ACTIVITY

Your teacher will provide a drawing of a tree. Write the name of each part of the tree.

SUGGESTED REFERENCE

Lewis, Forests and Forestry in Kentucky, University of Kentucky, College of Agriculture, Cooperative Extension Service, Lexington, KY 40506.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students study the parts of a tree. Let students share their knowledge of their own trees, such as different kinds of leaves, texture of bark, roots that grow above ground, etc.	Instruction Sheet 1	
2	If possible, obtain a bare-rooted seedling. Give a demonstrated talk on the functions of the crown, trunk, and roots of a tree.	Bare-rooted seedling (optional) "Functions of the Main Parts of a Tree" (Master Copy in this section)	
3	Provide each student or small groups of students a copy of the Guide. Have the students select a tree and examine the parts as listed on the guide. Have them record their findings and report to the class.	"Guide to Parts of a Tree" (Master Copy in this section)	
4	Provide each student a copy of the Check-Out Activity Sheet. Have him/her list the name of each part of the tree. Use the Answer Key to check the answers. Use the Instructor's Final Checklist to evaluate each student's performance.	Check-Out Activity Sheet (Master Copy in this section) Answer Key (in this section) Instructor's Final Checklist	

FUNCTIONS OF THE MAIN PARTS OF A TREE*

In terms of tree growth there are three main parts: crown, trunk, and roots.

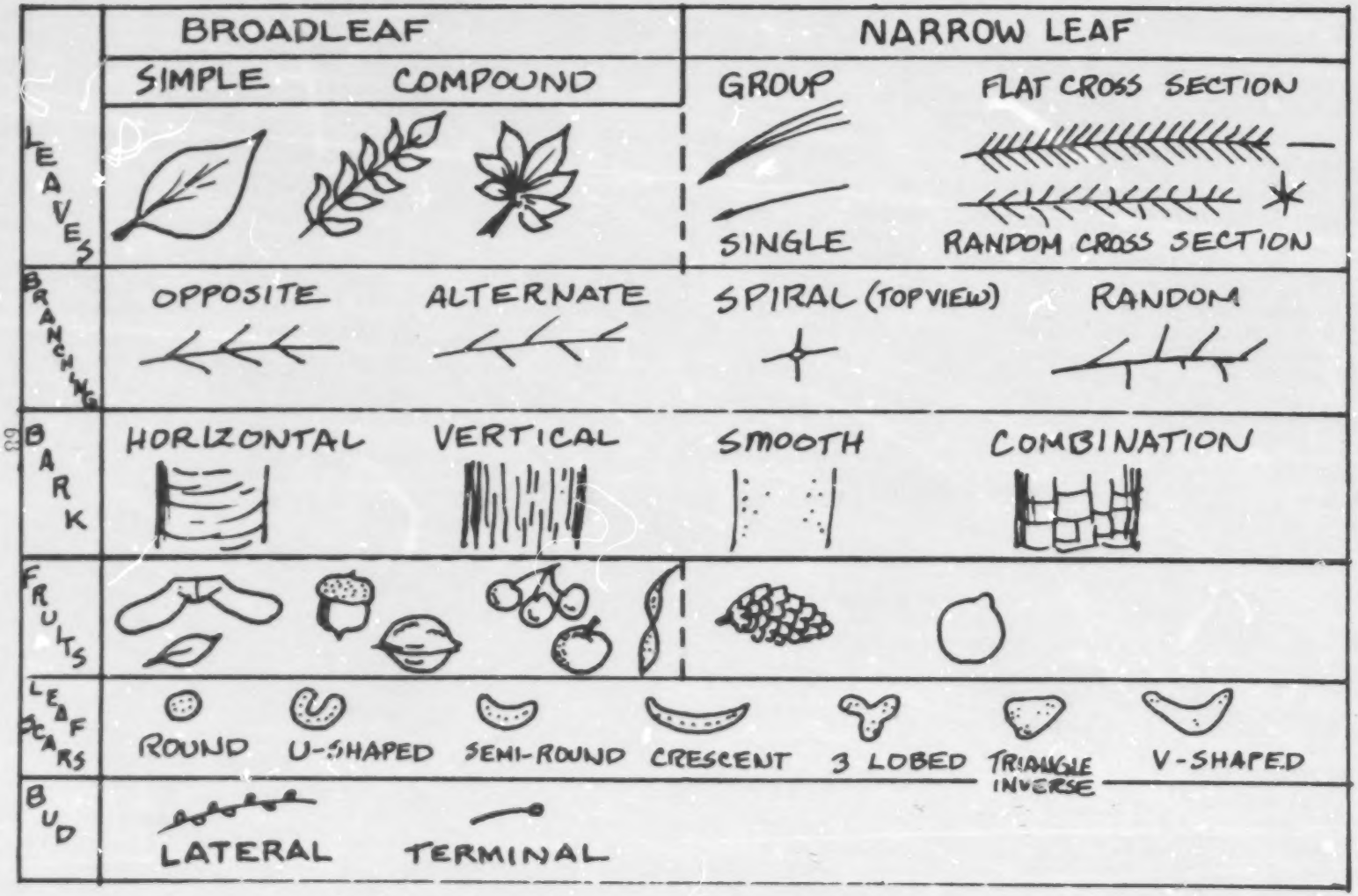
The crown itself is the top of the tree. It consists of the limbs or branches which extend to the twigs and terminate with the buds. The leaves, flowers, fruits, and seeds are borne by the branches.

It is within the crown portion of the tree that many of the vital processes take place which are responsible for growth and reproduction.

The trunk is the main stem of the tree. It supports the crown, serves as a pipeline for the flow of mineral solutions from the roots to the crown, and serves as a storehouse for foods - carbohydrates, fats, and sugars. When a tree is harvested, it is mainly the trunk in which we are interested.

The roots have four functions. They provide a base for the tree and serve as an anchor to hold the tree upright; they absorb water and dissolved minerals from the soil; they serve as a food storehouse, and they have different types of roots. Trees like spruces, hemlock, and white birch have shallow or surface roots which make them vulnerable to windstorms. Other trees like the oak, walnut, and hickory have a central deep-penetrating root, called a tap root, making them very resistant to wind damage. The third and largest group of trees have extensive root systems with both shallow roots and deep roots like tap roots.

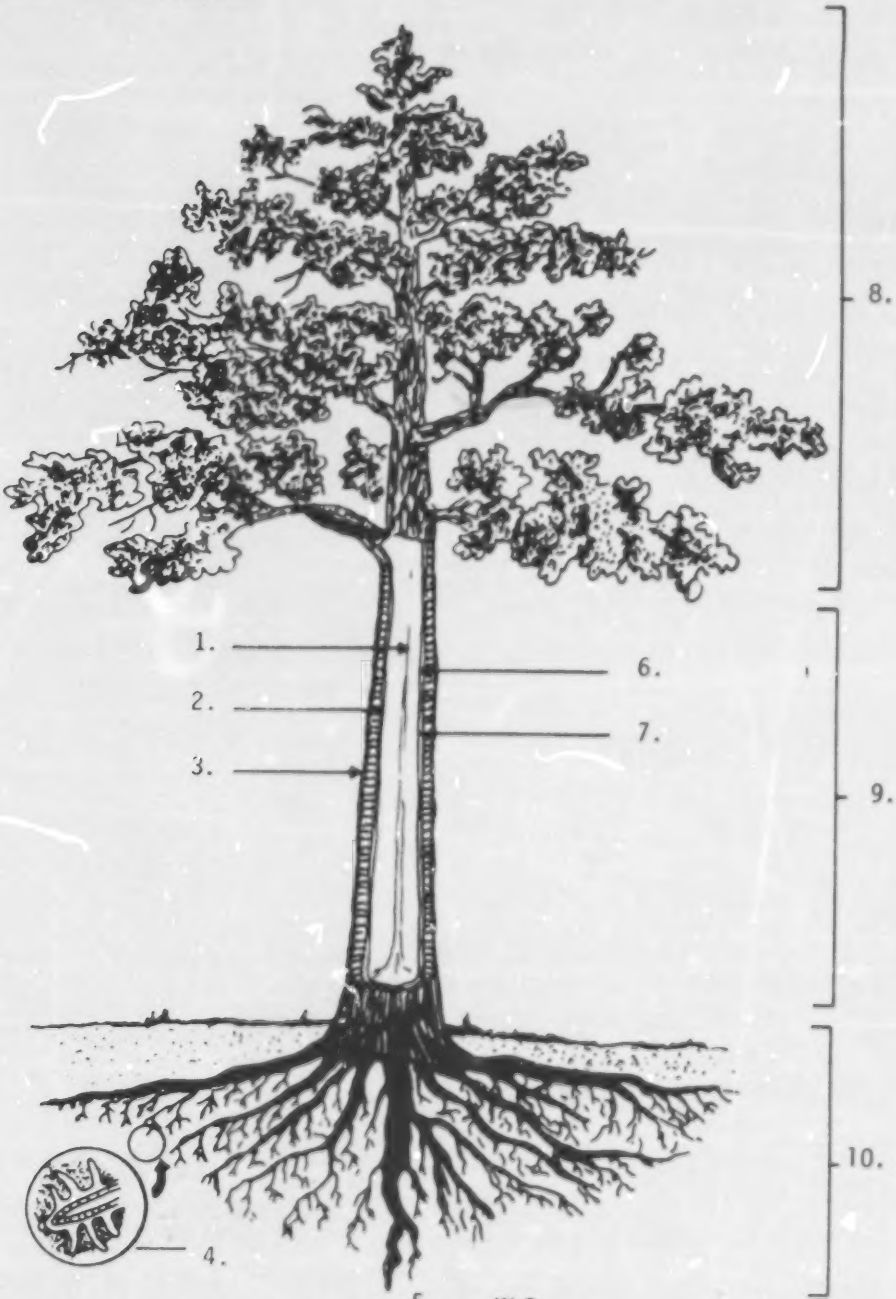
*Taken from Natural Resources and Career Awareness, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.


BROADLEAF
NARROW LEAF
SIMPLE
COMPOUND
GROUP
FLAT CROSS SECTION
LEAVES
SINGLE
RANDOM CROSS SECTION
BRANCHING
OPPOSITE
ALTERNATE
SPIRAL (TOPVIEW)
RANDOM
BARK
HORIZONTAL
VERTICAL
SMOOTH
COMBINATION
FRUITS
LEAF SCARS
ROUND
U-SHAPED
SEMI-ROUND
CRESCENT
3 LOBED
TRIANGLE INVERSE
V-SHAPED
BUD
LATERAL
TERMINAL

CHECK-OUT ACTIVITY

IDENTIFYING PARTS OF A TREE

Number your paper from 1-10. After each number, list the part of the tree. Do not write on this page.



CHECK-OUT ACTIVITY

IDENTIFYING PARTS OF A TREE

ANSWERS

1. Heartwood
2. Cambium
3. Outer bark
4. Root hair
5. Taproot
6. Sapwood
7. Inner bark
8. Crown
9. Trunk
10. Roots

IDENTIFYING TREES TO BE HARVESTED

OBJECTIVE

GIVEN a drawing of an uncut forest stand,

IDENTIFY THE TREES THAT SHOULD BE REMOVED FOR A SINGLE-TREE SELECTION HARVEST CUT.

YOU should identify the trees accurately.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that proper harvesting is to the long-term advantage to the landowner and the forest industry.

CONTENTS

Instruction Sheet	Learning Activity Number
I HARVEST CUTTING METHODS	1
Instructor's Final Checklist	
IDENTIFYING TREES TO BE HARVESTED	3

CHECK-OUT ACTIVITY

Your teacher will provide a drawing of an uncut forest stand. Identify the individual trees that should be removed that will allow the best trees room to grow.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	As students examine the drawing of each harvest cutting method, explain the system. Allow students to talk about personal experiences of tree removals at home, community, etc.	Instruction Sheet I "Harvest Cutting Methods" (Master Copy in this section)	
2	You may contact your local forestry service (see PA-AG/NR-2) to arrange for a visit to a forest and/or to arrange for interviews with a forester. If this is not feasible, students may examine a stand of trees at school or in their local communities.	Forest and/or Forester and/or Stand of trees	
3	Provide each student a copy of the Check-Out Activity Sheet. Check their answers by the Answer Key (NOTE: You may want to prepare some alternate sketches or use pictures from forestry journals.) Use the Instructor's Final Checklist to evaluate each student's performance.	Check-Out Activity Sheet (Master Copy in this section) Answer Key (Master Copy in this section) Instructor's Final Checklist	

HARVEST CUTTING METHODS*

Wood is a valuable material which should not be unduly wasted. Proper tree harvesting involves more than cutting mature trees. Consideration must be given to the future welfare of the harvested area, the regeneration of a new forest land, effects on wildlife, soil, water, and other factors.

There are many different harvesting systems that can be properly applied. Single-tree selection removes only selected individual trees from the forest as they attain maturity. The older and poorly formed trees are usually removed.

A modification of this system is group selection, which removes scattered patches of two or more trees each. Both of these systems are used in "all-age" forest management. Stands managed in this manner contain trees with widely varying ages from seedlings to mature trees.

A shelterwood cutting usually involves a higher cutting intensity than the selection methods. One-fourth to one-half of the trees are harvested at one time. The remaining trees serve as a seed source and shelter for the young seedlings that will form the next forest stand on the area. After a new stand is established, the remaining older trees are removed.

The most dramatic harvesting method is clearcutting. As its name implies, all trees are harvested from the area at one time. Although its use has been severely criticized, and in certain cases this criticism was justified, this method has several proper applications. Regeneration of tree species which cannot tolerate shading is a primary reason for clearcutting an area. Elimination of undersirable seed sources for a replanting of the area with better species and/or generally improved seedlings would be another sound reason.

None of the systems mentioned above is universally correct under all situations. Each has advantages and disadvantages which must be evaluated in conjunction with individual stand conditions. Unfortunately, many of our forest areas are still being harvested without using any well defined system of management. Too often, it is simply a matter of "cut the best and leave the rest."

*Adapted from Lewis, Forests and Foresty in Kentucky, University of Kentucky.

CHECK-OUT ACTIVITY

IDENTIFYING TREES TO BE HARVESTED*

Write the letter which appears under the individual trees that should be harvested that will allow the best trees to grow. Do not write on this sheet.

*Ibid.

CHECK-OUT ACTIVITY

IDENTIFYING TREES TO BE HARVESTED*

ANSWERS

Tree B should be removed because it is poorly formed.
Tree D should be removed because it is mature and because its removal allows the best trees to grow.

*Ibid.

APPENDIX

VOCABULARY LISTING

Balled and burlap tree - a tree that has a ball of dirt wrapped in burlap around the root.

Bare-rooted tree - a tree which has the roots exposed.

Breed - A particular type of animal which, for a long period, has been bred only with those of the same type.

Coal seam - the layer of coal underground.

Contour - the outline of the land.

Conventional mining - the mining method in which coal is undercut and blasted loose to be gathered for transport by machine.

Crosscut - short passageways driven at right angles to an entry. They connect one entry to another.

deciduous hedge - a hedge from which the leaves fall annually.

Decompose - to decay.

Entry - the main passage driven into a coal seam.

Evergreen hedge - a hedge which keeps its leaves all year.

Face - the area from which coal is being taken. A mine may have many operating faces.

Floor - any material that is put back in place of the extracted coal to provide ground support.

Foliage - leaves on a plant.

Forage - to search for food.

Hedge - a row of closely planted shrubs or bushes forming a fence.

Intersection - the area in a mine where a crosscut connects with another entry.

Landscaper - One who arranges lawns, trees, bushes, etc. on a plot of ground to make it more attractive.

Lateral branch - branch growing from the side of the trunk.

Livestock - animals kept for use on a farm or raised for sale.

Mulch - leaves, straw, peat moss, etc. spread on the ground around plants to prevent evaporation of water from the soil or freezing of roots.

Pillars - large blocks of coal left after entries and crosscuts have been made. They help support the mine roof.

Prune - to cut away or remove unnecessary parts.

Ribs - the sides of a pillar or of an entry. The solid coal on the side of any underground passage.

Roof - the layer of hardened clay, limestone, sandstone, or other materials that lies over the coalbed; the top of an entry.

Roof bolt - a long steel bolt, which is inserted in a drilled hole, used to support the mine roof.

Room - the area from the entry or crosscut to the face of an underground mine.

Simulated - imitation.

Surface mining - the mining method in which coal is extracted through the surface of the ground.

Terminal branch - branch growing from the tip of the trunk.

Turf - A top layer of earth containing grass plants with their matted roots; sod.

REFERENCES APPROPRIATE FOR CAREER EXPLORATION

Documents

Exploring Careers, 1979
Bulletin 2001
Bureau of Labor Statistics
1371 Peachtree Street, N.E.
Atlanta, GA 30309
Telephone: (404) 881-4418

Occupational Outlook Handbook
Bulletin 1955
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
(Cloth Cover) Stock No. 029-001-02067-8
(Paper Cover) Stock No. 029-001-02059-7

Dictionary of Occupational Titles
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
Stock No. 029-013-00079-9

Sources of Information

Practical Arts Unit
Bureau of Vocational Education
21st Floor
Capital Plaza Tower
Frankfort, KY 40601
Telephone: (502) 564-3472

Gregg/McGraw-Hill
Webster Division
1221 Avenue of the Americas
New York, NY 10020

McKnight Publishing Company
Bloomington, IL 61701

New Jersey Vocational Technical
Curriculum Laboratory
Rutgers University
4103 Kilmer Campus
New Brunswick, NJ 08903

Ohio Department of Education
Division of Vocational Education
Career Development Service
Columbus, OH 43215

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

Xerox Educational Publications
P.O. Box 16629
Columbus, OH 43216

PRACTICAL ARTS VIDEOTAPES

These videotapes are available through the Kentucky Department of Education, Office of Research and Planning, Division of Materials and Curriculum, 19th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601; Telephone: (502) 564-2000.

Agribusiness, Natural Resources and Environmental Occupations

"Coal: Kentucky's Ace in the Hole": 1/2-inch color cartridge; 23 minutes; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Describes types of occupations available in the coal industry and discusses useful coal by-products.

"Wildlife": 3/4-inch color cassette; 25 minutes. Explains the role of wildlife in conservation.

"Energy Careers": 1/2-inch color cartridge; 15 minutes; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Explores careers in the alternative energy areas of solar energy, wind, and coal liquification.

"Agribusiness": 3/4-inch color cassette; 18 minutes. Deals with careers in agriculture and other farm-related careers.

Business and Office Occupations

"The Secretary": 3/4-inch cassette; 18 minutes. Identifies various careers available in the secretarial field.

Communications and Media Occupations

"One Moment, Please": 1/2-inch color cartridge (2 cartridges available); 18 minutes. Explores occupations, ranging from camera operator to producer, available in radio and television production and necessary qualifications.

"Number, Please": 3/4-inch color cassette; 18 minutes. Discusses careers available in the telephone industry and shows on-the-job interviews for jobs in the industry.

"Roll the Presses": 3/4-inch cassette; 19 minutes, 20 seconds. Gives overview of careers needed to produce a newspaper.

Construction Occupations

"Construction Careers": 1/2-inch color cartridge; 20 minutes; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Explores types of occupations, including carpenters, electricians, and plumbers, in construction careers and necessary skills needed for these careers.

Home Economics Occupations

"Gainful Home Economics": 3/4-inch color cassette; 20 minutes, 45 seconds. Describes occupations related to home economics in which people are gainfully employed.

Health Occupations

"RX Good Health": 1/2-inch color cartridge; 23 minutes; 2 copies on 3/4-inch color cassette. Explores health careers, such as medical secretary, laboratory technician, and physical therapist, in addition to doctor and nurse.

Hospitality and Recreation Occupations

"Hospitality Unlimited": 1/2-inch cartridge tape; 16 minutes; color; also on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Identifies careers in the restaurant industry and hotel/motel management.

Manufacturing Occupations

"Down the Assembly Line": 3/4-inch cassette; 18 minutes. Depicts production line workers on the job; introduces students to the division of labor system whereby each worker becomes skilled in a single operation.

Orientation to the World of Work

"The Rest of Your Life": 2/4-inch cassette; 30 minutes. Introduces students to step-by-step procedures necessary in seeking employment.

Personal Service Occupations

"Barbering and Cosmetology": 3/4-inch cassette. Explores careers available in these two areas.

Public Service Occupations

"Dear John Mail": 1/2-inch color cartridge; 20 minutes; 2 copies on 3/4-inch color cassette. Explores the types of postal careers and available postal facilities.

"Law Enforcement": 3/4-inch color cassette; 25 minutes. Presents occupations available in law enforcement careers, ranging from policeman to radio operator, and their functions; also identifies necessary qualifications for entering the occupations.

"The Military": 3/4-inch cassette; 17 minutes, 30 seconds. Gives students an overview of various careers associated with the military.

Transportation Occupations

"Tracking A Trucker": 1/2-inch cartridge tape; 22 minutes; color; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Explores occupations needed to support the trucking industry from mechanic to driver.

"The People of the Airlines": 3/4-inch cassette; 22 minutes. Shows people on the job at the airport and on the airplane.

ADDRESSING STUDENTS WITH SPECIAL NEEDS

Some students may need special help in achieving competencies. Ideas are presented here for helping identify those students and modifying materials and techniques to help them succeed.

Identifying Students with Special Needs

Generally speaking, those students who cannot succeed in the regular vocational education programs without special help are termed "students with special needs" (Vocational Education Act of 1963 and Amendments). Persons most likely to be identified as students with special needs are the academically and economically disadvantaged and the handicapped--the mentally retarded, deaf and hard of hearing, speech impaired, emotionally disturbed, orthopedically (physically) impaired, health impaired, and learning disabled.

The handicapped are further identified as those (1) with a physical or mental disability that substantially impairs one or more major life activities--walking, seeing, hearing, speaking, working, or learning; (2) who have a record or history of such impairment or condition; and (3) who are regarded as having an impairment (Rehabilitation Act of 1973). Women, minorities, the limited English speaking, and others likely to be underemployed or striving for equal opportunity in employment when meeting the criteria for academic or economic deprivation, are specifically identified in the disadvantaged group to be given special help.

Formulating a Basic Approach to Teaching

Society recognizes the right of every individual to an appropriate education, and the law mandates giving persons with special needs an equal chance. In brief:

1. The Vocational Education Amendments of 1976 give special emphasis to developing and providing programs of vocational education for "those with special educational handicaps" and reserves moneys to do so.

2. The Education for All Handicapped Children Act of 1975 assures that all handicapped children between the ages of three to twenty-one have available to them a free, appropriate public education which relates to their unique needs and is provided in the least restrictive environment.

3. The Rehabilitation Act of 1973 prohibits discrimination on the basis of handicap in any program or activity receiving federal financial assistance and directs employers to take affirmative action in hiring handicapped people.

4. The Education Amendments of 1972 prohibit discrimination on the basis of sex in educational programs receiving or benefiting from federal financial assistance.

5. The Civil Rights Act of 1964 prohibits discrimination in employment on the basis of sex, race, color, religion, or national origin in any program or activity receiving federal financial assistance--(including training for employment.

We must, then, provide equal opportunity to learn in our instructional processes.

Basically, an approach to teaching which recognizes individual differences in all students provides the best atmosphere for disadvantaged and handicapped students. This approach allows students to work at different rates; involves large group, small group, and individual instruction; incorporates a variety of instructional materials, media, and teaching techniques; and involves a variety of learning activities--reading, doing, discussing, listening, viewing, experiencing, sharing, cooperating, relating, using the senses, etc. It gives disadvantaged and handicapped students the dignity of exploring, learning, and facing the same experiences and responsibilities as other students, without limiting their possibilities by stereotyped concepts of what they can or cannot do.

It involves being organized, with students completely familiar with the teaching/learning plan. When beginning a CBVE class, for example, explain what learning to attain competencies means, how the students will carry out their work, how to use the modules, where to find materials, how and when tests will be given, how "passing" or achieving competency is determined, and what your role as a teacher is.

It also means teacher direction for those students who are not self-directed learners--those with poor academic backgrounds who thrive on teacher interaction and need immediate feedback, instruction simplified, procedures modified, social development as well as specific job skills, role models, or other special aid. For these students, the learning activities described in the modules may become the teacher's lesson plan and be utilized in large-group and small-group settings before the individual student attempts doing learning activities alone. The teacher-directed class might proceed as follows: teacher introduction to tasks to be performed by module or cluster of modules, explanation of what is to be learned and why, presentation of information in small chunks, demonstrations, student tryout and practice, time for questions and answers, trial test followed by reteaching, and evaluation. The teacher will employ a variety of strategies to address the learning needs and styles of the student.

Using Special Strategies

In order to determine the most appropriate teaching strategies, assess the students for kinds of special help required, and develop a plan for meeting any unique needs. Refer to Mainstreaming Guidebook for Vocational Educators by Dahl, Appleby, and Lipe (Olympus Publishing Company, Salt Lake City, Utah 84105), for modifications and general classroom strategies for meeting the unique needs of the different handicapped populations.

Also, enlist the advice and help of employers, support personnel, and agencies and organizations serving disadvantaged and handicapped populations in your school system and geographic area.

Redirecting Teaching Strategies Usually Used

Many of the strategies usually used with regular students may be redirected or modified and also provide effective learning activities for students with special needs. An explanation of how this many be done follows.

AUDIO-VISUALS (films, filmstrips, slide/tape presentations, videotapes, and ETV and commercial television programs). The combination of sight and sound provides more effective communication than either sight or sound alone. Audio-visuals may be used to supplement or replace other methods of presenting information. The hearing impaired will require captioning, signing, or a printed script written at the appropriate reading level or presenting only essential details. The visually impaired may glean information from the sound source, but additional explanation will need to be provided for any visual display of information which is not explained adequately by the narration. Some audio-visual presentations, particularly 8 mm and 16 mm films, may move too fast for the information to be grasped and need to be evaluated with this in mind.

CONTACT WITH WORK ENVIRONMENT. Handicapping conditions, limited finances, geographic isolation, cultural difference, limited communication skills, and social isolation have caused disadvantaged and handicapped persons to have little contact with the world of work. Familiarity with the work setting in which a particular job takes place, relationships with other workers, business use of the telephone, relationship of one's job to other jobs in the same business are just a few examples of areas where special students may require special exposure by means of field trips, spending a day on the job, viewing films, or having additional training sessions.

Note: For those with physical impairments, field trips, on-site job observations, and work experience opportunities will be limited to "accessible" businesses in the community. Before deciding where to go, determine whether the facilities are accessible.

DEMONSTRATION AND TRYOUT. Demonstration by the teacher, experienced workers, and previously-trained students provide reliable role models for learners. Steps, procedures, precautions, physical manipulation, and techniques are imprinted visually in the order and at the time they should occur in task performance. Immediate tryout of the task following the demonstration or an immediate attempt of each step, technique, or procedure as it is demonstrated provides students direct involvement, permits correction and clarification, and promotes retention. Tryout also identifies areas in performance steps, techniques, tools, and work environment where handicapped students need to have modification in order to perform tasks and meet industry standards.

ELIMINATION OF STEREOTYPING. Disadvantaged and handicapped people face more than the sex role stereotyping myths in their quest for employment. The following are just a few examples: "Deaf people are dumb." "The best job for blind people is tuning pianos." "He'll never be able to do that; he's a cripple." "Mr. _____ was no good; neither is his son." "She can

never do that; her parents didn't go to college." In addition to overcoming the unfounded assumptions of others, disadvantaged and handicapped persons often have equal misconceptions about themselves thinking: "I can never do that." "_____, who is deaf, does assembly line work; that's what I'll do, too." "I'll never be anybody."

Overcoming stereotyping may begin with using sex fair instructional materials and media, exploring interests and abilities, exploring two or three nontraditional jobs, or complimenting accomplishments. It may include planning how to reach an educational goal, providing role models (a person with a like handicap or socioeconomic background who has succeeded), as well as observing persons in nontraditional work roles. It means doing whatever raises aspirations and increases self-worth. It means attempting to eliminate underemployment.

EMPLOYER INVOLVEMENT. Programs with employer input are more practical and in line with the current needs of the job market. Employers who make input feel a special kinship to the program and get a chance to see the students before meeting them in the job market.

For disadvantaged and handicapped students, employer involvement offers a very special opportunity to remove common misconceptions about their capabilities. It enables employers to help with any modification needed, see students performing tasks, and observe how the students relate to others. It gives students a chance to prove that they can do the work, that they will not endanger themselves or others, and that they will not increase expenses. These are major employer concerns. Both students and teachers should be prepared to provide reassuring answers and evidence to show there is no more risk than with the nonhandicapped.

Employers may be involved by giving class presentations; giving suggestions for program improvement and modifications; conducting mock interviews; and providing work experience, observations, worker interviews, job analysis, etc.

HANDS-ON EXPERIENCES, PROBLEM SOLVING, PERSONAL INVOLVEMENT (work samples, tryout exercises, games, role playing). Being involved in a sample of work through completing a product, performing related paper work, or role playing interpersonal relationships on the job keeps students interested, holds attention to the learning tasks, and injects the realities of working and job performance in the teaching/learning situation. It makes the student feel that the instruction is practical and valuable. Accomplishment means "qualified for work"--a great boost to self-esteem for those who doubt self-worth.

The instructor and other students should avoid taking over when handicapped students are awkward or slow in completing a task. The student cannot master the skill if someone else does it.

ILLUSTRATIONS (pictures, graphs, bulletin boards, transparencies, and other visuals). The disadvantaged, the mentally retarded, and the hearing impaired, particularly, are especially oriented to visual methods of learning. Other students, with the exception of the blind and some visually impaired, will appreciate visual presentation of information to

be learned. Student handouts, with the steps to a task illustrated and briefly and simply explained, are especially helpful. Captioning and brief explanations are important supplements. Many illustrations may be adapted for the visually impaired by making them tactile (so that they can be felt). Sometimes enlarged print and bold outlines help.

INTERACTION; INDEPENDENCE. Economic deprivation, geographic isolation, cultural isolation, and restrictions on mobility and social relationships imposed by physical impairments have limited the experiences of the disadvantaged and the handicapped in the community at large. Many have no previous work experience, little observation of the worker's daily routine, and limited social experiences. They have been sheltered at home, absent from the scene, and at best, onlookers.

So that they will not continue in this role after vocational training, experiences in the community and involvement with nonhandicapped people and other students are of utmost importance. These students, as well as their families and the working community, need proof that they can function independently and competently. They need to establish contacts who can serve as references to recommend them as competent workers who can relate to others.

Field trips, worker interviews, cooperative work experience, spending a day on the job, giving talks before civic groups are, therefore, important to the acclimation of disadvantaged and handicapped students to the world of work. Participating in team work projects with other students; pairing with a slower or faster learning peer; pairing with a nonhandicapped, a nondisadvantaged, or person from another race or culture will help achieve faster comprehension and understanding and promote learning communication skills. Teaching special units dealing with related communication and social skills will also be necessary; for example: office etiquette, relationships with employer and other employees, daily work expectations which are not direct task performance, telephone skills, appropriate dress and grooming habits, to name a few.

LISTENING (explaining, discussing, reacting orally). Learning by listening is an important tool to the disadvantaged, the visually impaired, the speech impaired, the learning disabled, and others who "prefer to be told" or "have to be told" rather than read about it.

The visually impaired require identification of familiar sounds in the work place to determine location of different work areas, equipment functions, and hazards. The hearing impaired require sight substitutions, such as indicator lights, for critical sounds they cannot hear. They may use lip reading, interpreting, and sound conduction or amplification devices. The retarded need to become accustomed to the sounds of the work place so that they can work without being distracted. The speech impaired need to be given the right to listen although they may have trouble participating, or may not be able to participate orally.

When information is presented for listening, instruction in how to listen (what to listen for) is important. An outline of the information presented, supplemented by visuals, tryout exercises, showing, completion

of a guidesheet questions to be answered, analysis of cases or problem situations, or other application activities will enhance use and retention of information heard.

Listening is a vocational skill as well as a learning skill. Workers must be able to receive information by listening as well as provide information for listening. Most on-the-job instruction is given orally. Explanation must be given to and received from customers, co-workers, and supervisors.

READING HELPS. Being fluent in the technical vocabulary or language of the job and able to read at the level required by the job is a part of occupational competency. On-the-job reading requirements may vary from the reading of signs to following instructions given in technical manuals. The instruction given in reading, then, for vocational purposes, will depend on the reading skills possessed by the student and the reading requirements of the job. Whether or not a supplemental class in remedial reading is offered, the vocational instructor will find that providing reading aids also helps provide job skill.

Braille materials, large print textbooks, magnifying devices, and recordings may be provided for the visually impaired. Materials may be simplified or outlined for the hearing impaired and others with limited language skills. The native language may be supplied above the English for critical information in textbooks used by the limited English-speaking. Familiarity with the setting in which the printed information is applied may be given via field trips, demonstrations, or films to make reading easier and more meaningful.

Students with exceptional reading problems may require the help of a special reading teacher or be enrolled in a remedial reading program. Some schools employ vocational reading teachers to assist vocational students with developing vocational reading skills and doing the reading required in their programs.

RECORDING AND RECORDINGS (tapes, records, radio programs). Information may be presented and gained by listening to recorded information rather than reading. This strategy will aid the nonreader, the poor reader, the visually impaired, the learning disabled, and others through use as a variation of teaching technique. Recording is also a useful tool for the deaf in notetaking; the recording script may be transcribed into print later by a hearing individual. It will also provide instruction for those who have missed initial classroom presentation of information or who need review. Recordings may be supplemented by slides and pictures.

RELATED MATH. Competency in math, like competency in reading, is more critical to some jobs than to others. Math is best taught in relation to the task of which it is a part. This instruction should incorporate basic math and remedial math instruction as needed. A cooperative or team teaching effort with the math teachers or related math instructors in the school will relieve the burden on the vocational instructor. Enough practice and application exercises should be provided to insure retention of the math operations involved. It is helpful to compile a list of the

math competencies needed to complete the training program, prepare an assessment test to determine student skills, and plan in the beginning a program which the student can follow to attain the basic math competencies prerequisite to the course. If the skills cannot be acquired simultaneously to the job skill training program, the student should postpone entry into the course until the prerequisite skills are attained. It may be necessary to prepare a special manual and modules to provide the related math instruction.

REMEDIAL AND RETENTION EXERCISES. Doing learning activities does not necessarily make students occupationally competent. Performance must be observed, misunderstandings clarified, procedures and techniques corrected, and repetition called for at a future time. Lesson planning should anticipate theory and tasks with which students are likely to have difficulty, include additional practice exercises, and provide alternate approaches to teaching. Repetition for retention should be provided, such as repetition of information in different media presentations or use of different types of application exercises. Review sessions, keeping notebooks, completing work samples, doing live work, and solving cases will also help.

SAFETY. The Occupational Health and Safety Act has increased employer concern for safety and underscored the importance of providing safety instruction along with task performance. It is especially important for the handicapped in two ways: (1) to overcome employer concern about the handicapped person's ability to take care of himself/herself and not endanger the lives of others; (2) to identify and deal with situations which are hazardous for persons because of particular handicaps.

To meet these needs for safety instruction, the handicapped student not only needs the basic or general safety instruction related to the occupation but safety instruction or special safety provisions needed for a person with his/her particular handicap. An example is the installation of a blinking light to tell a person who is deaf that the equipment is running.

Note: The Kentucky Department of Labor, Occupational Safety and Health Program, Division of Education and Training, Frankfort, Kentucky 40601, Phone: (502) 564-6895, offers training programs to help vocational instructors teach safety.

SUPPORT SERVICES. Some students will require emotional, social, and financial support in order to succeed in the instructional programs. Others will need career counseling and special assistance in becoming employed. Government agencies, special schools, special personnel, and organizations for disadvantaged and handicapped persons can provide this help. The following are examples and should not be considered an all-inclusive list: resource room teachers, rehabilitation counselors, guidance counselors, tutors, remedial teachers, instructors in special schools, occupational therapists, diagnostic specialists, media personnel, handicapped workers, workers who are members of a minority group, social workers, and others who can serve as role models. Survey the community to identify persons who serve the needs of disadvantaged and handicapped persons in your area and incorporate their assistance in related learning activities.

UNIQUE MODIFICATIONS (modified equipment, tools, learning aids, changes in work environment, adaptations in course or training program content). Some students require special help in meeting physical job requirements. When considering modification, it is important to concentrate on what the student can do. If at all possible, enable the student to function in the work environment as it is usually found. Employers look favorably on handicapped persons with this kind of preparation.

Rehabilitation centers; organizations and schools for the blind, deaf, dyslectic, disabled, and the mentally handicapped; and publishers and manufacturers of special instructional materials, aids, and equipment can offer aid in meeting unique needs. Consultation with special education personnel and rehabilitation counselors is a good starting point. The student should also be asked to make suggestions.

Care should be taken to insure occupational competency. Prospective employers should be shown how the modification operates in the work setting and how it increases efficiency.

The previously described list of strategies is not exhaustive. Others may be added. All will need to be directed toward the occupation for which training is being given, the students enrolled, the availability of instructional materials, and the community. It is also important to remember that what works well for one group of students or a particular student will not necessarily work well for another.

PRACTICAL ARTS

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

Task Assignment Sheets PA-AG/NR 1-14

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: TAKING SOIL SAMPLES

INTRODUCTION

Taking a soil sample is necessary in determining the kinds and amount of fertilizer needed to produce crops. In this task assignment sheet you will learn how to take a soil sample.

OBJECTIVE

GIVEN an area to be sampled, a tool to obtain the sample, and an appropriate container,

TAKE SOIL SAMPLES OF THE AREA.

YOU will be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. READ and DISCUSS Instruction Sheet I, HOW TO TAKE SOIL SAMPLES.
2. ANSWER questions about taking soil samples. Your teacher will provide the questions.
3. WATCH your teacher take a soil sample.
4. PRACTICE taking a soil sample.
5. ARRANGE with your teacher to complete this task by going through the Check-Out Activity.

CHECK-OUT ACTIVITY

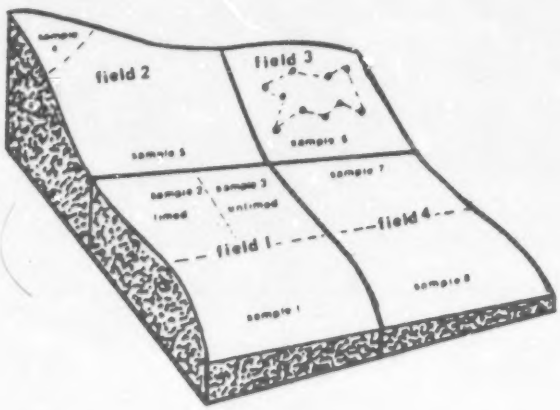
Choose an area of land and take eight soil samples.

INSTRUCTION SHEET I

TAKING SOIL SAMPLES

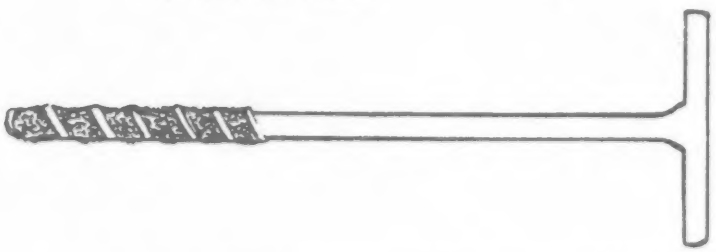
To sample an area properly, follow these procedures:

1. Survey the land to be sampled, grouping similar areas of soil together into plots (hilly areas, bottomland, etc.).



2. In obtaining soil samples, several tools may be used: a soil auger, soil tube, or spade. Regardless of the type of sampling tool used, insert it 6"-8" into the soil since it is in this area that most of the root growth and activity takes place.

   a. Soil Auger - The soil auger is a sampling device with a screw-type thread that is held upright and twisted into the ground. As it is removed, soil will stick to the threads.



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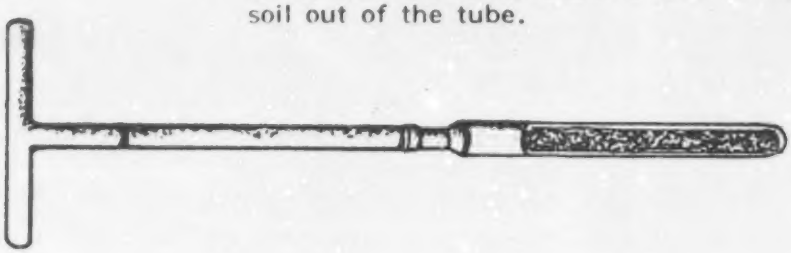
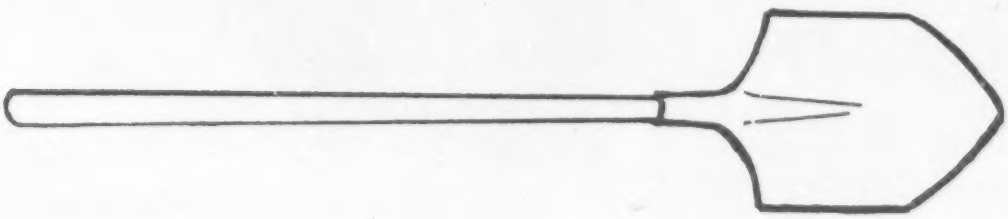
INSTRUCTION SHEET I, (page 2)

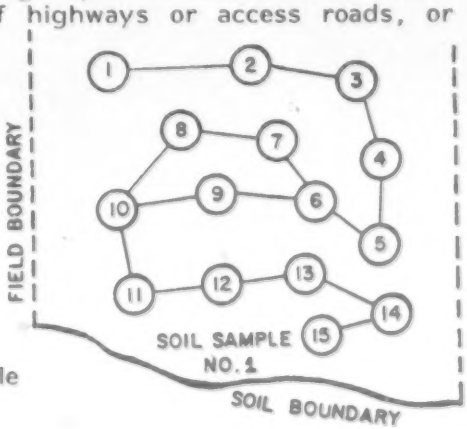
b. Soil tube - The soil tube is similar to the auger except that it has a hollow tube instead of the screw. Insert the tube into the soil, remove the tube, and push the soil out of the tube.



c. Spade - Using a flat-bladed spade, remove a section of soil sufficient to cover the entire spade. With a knife, cut a 1" wide section in the middle of the soil. Use this as the sample.



3. Move about different parts of the area to be sampled. Take 8 to 15 samples in each plot. This is called "taking a random sample." Avoid areas that will not give you an "average" picture of the soil. Such places might be fence rows, edges of highways or access roads, or close to manure droppings.

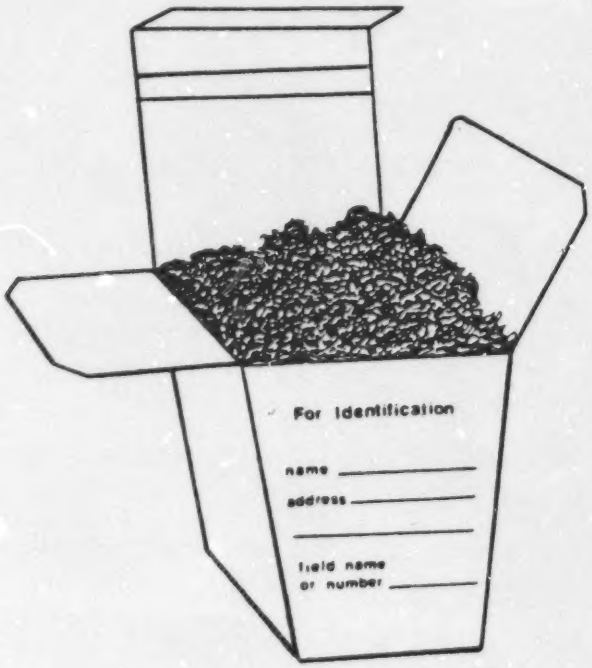


Random Sample

INSTRUCTION SHEET 1, (page 3)

4. After removing each sample from the sampling tool, place it in a clean container such as a bucket, sack, or box. Remove rocks, sticks or other debris. Be sure to keep the sample separate. Then allow it to air dry.

5. Mix the soil in each sample thoroughly. This gives you a representative sample of the entire area you have sampled. Put 1/2 - 1 pint of soil into the proper container, such as the soil sample box pictured below.



INSTRUCTOR'S FINAL CHECKLIST

TAKING SOIL SAMPLES

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

In taking soil samples, the student:

1. Took samples from different parts of the area ..... [ ] [ ]
2. Obtained at least eight samples ..... [ ] [ ]
3. Took samples from a depth of 6" - 8" ..... [ ] [ ]
4. Obtained a sufficient amount of soil for each sample ..... [ ] [ ]
5. Placed each sample in a clean container ..... [ ] [ ]
6. Allowed each sample to air dry ..... [ ] [ ]
7. Mixed the soil in each sample thoroughly ..... [ ] [ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

PLANTING SHRUBS AND TREES

INTRODUCTION

Planting a shrub or tree in a new location involves moving it from its original growth site. To survive the shock, it must not be damaged during this process. Either a balled and burlapped or bare-rooted tree or shrub may be planted. A balled and burlapped plant has a ball of earth, held in place by a layer of burlap, around its roots. A bare-rooted plant is dug and transplanted without this earth ball. In this task assignment sheet, you will learn how to plant shrubs and trees.

OBJECTIVES

(1) GIVEN a balled and burlapped shrub or tree, spade, peat moss, water, and mulch,

PLANT THE SHRUB OR TREE.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

OR

(2) GIVEN a bare-rooted shrub or tree, pruners, spade, peat moss, water, and mulch,

PLATE THE SHRUB OR TREE.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. READ and DISCUSS Instruction Sheet I, HOW TO PLANT BALLED AND BURLAPPED SHRUBS AND TREES.
2. ANSWER questions about planting balled and burlapped shrubs and trees. Your teacher will provide the questions.
3. WATCH your teacher plant a balled and burlapped shrub or tree.
4. PRACTICE planting a balled and burlapped shrub or tree. WORK with a small group of classmates.

LEARNING ACTIVITIES (Continued)

5. READ and DISCUSS Instruction Sheet II. HOW TO PLANT BARE-ROOTED SHRUBS AND TREES.

6. ANSWER questions about planting bare-rooted shrubs and trees. Your teacher will provide the questions.

7. WATCH your teacher plant a bare-rooted shrub or tree.

8. PRACTICE planting a bare-rooted shrub or tree.

9. ARRANGE with your instructor to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Plant a balled and burlapped shrub or tree; OR a bare-rooted shrub or tree. Your teacher will provide the land area and the necessary tools and supplies.

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VOCABULARY

Balled and burlap tree - a tree that has a ball of dirt wrapped in burlap around the root.

Bare-rooted tree - a tree which has the roots exposed.

Contour - the outline of the land.

Decompose - to decay.

Lateral branch - branch growing from the side of the trunk.

Mulch - leaves, straw, peat moss, etc. spread on the ground around plants to prevent evaporation of water from the soil or freezing of roots.

Prune - to cut away or remove unnecessary parts.

Terminal branch - branch growing from the tip of the trunk.

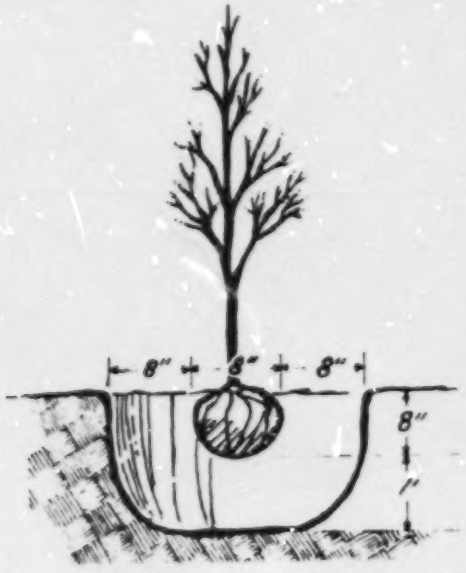
INSTRUCTION SHEET I

HOW TO PLANT BALLED AND BURLAPPED SHRUBS OR TREES

Balled and burlapped plants are plants that have been dug with a ball of earth surrounding their roots. This earth ball is held in place by a layer of burlap. Most evergreen shrubs and trees with a diameter over 2½" are planted balled and burlapped. Using this planting method increases the possiblity of getting the plant to live and also eliminates the necessity for pruning before planting. Transplanting using this method can be done almost any time during the year when a proper transplanting site can be prepared and adequate water is supplied.

To plant shrubs or trees using the balled and burlapped method:

1. Dig the hole 12" deeper than the depth of the root ball and twice as wide as the root ball.



2. Loosen several inches of soil at the bottom of the hole to encourage drainage.

INSTRUCTION SHEET 1, (page 2)

3. Mix one part peat moss with two parts of the soil removed from the hole; mix on burlap or plastic.

2 PARTS SOIL— 1 PART PEAT

4. Put about 12" of this mixture in the bottom of the hole.

5. Place the shrub or tree in the hole with the burlap still around the tree or shrub. Adjust the shrub or tree so that it is set about 1" higher than it originally grew.

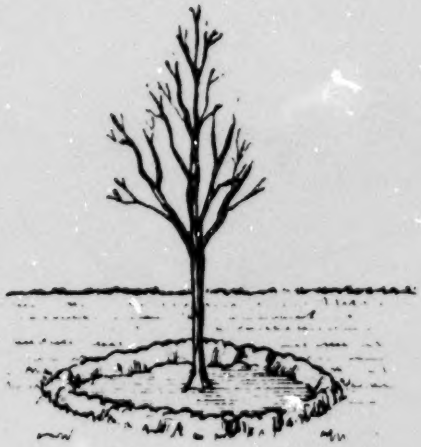
6. Unfastened the burlap and fold it back to about 1/3 the height of the soil ball. It will gradually decompose in the soil.

7. Fill the hole about 1/2 full with soil mixture. Firm with your feet. Then add water to fill the hole.

INSTRUCTION SHEET 1, (page 3)

8. After the water has drained away, finish filling the hole with the soil mixture to the level of the surrounding soil surface.

9. Make a 2" saucer around the tree by mounting soil at the rim of the filled area. This will form a water basin for the newly planted shrub or tree.



10. Fill the saucer with water.

11. Place a layer of loose surface mulch such as straw, leaf mold, or pine needles on the surface of the watering basin. This will help conserve moisture and lessen fluctuation of soil temperature. Give special attention to the water needs of the plant throughout the first growing season.

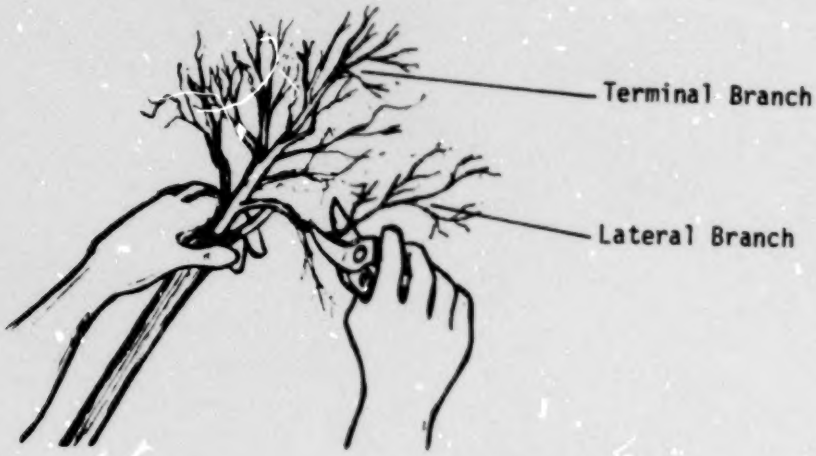
INSTRUCTION SHEET II

HOW TO PLANT BARE ROOTED SHRUBS OR TREES

Bare-rooted shrubs or trees are dug and planted with no soil ball surrounding their roots. Small deciduous trees with a diameter of 2" or less are usually planted bare-rooted. The roots may be packed in plastic or a loose packing medium such as sawdust or peat moss to prevent the roots from drying out before the tree is planted. Small evergreens can be planted bare-rooted if they are planted soon after they are dug. Bare-rooted trees should be planted during the dormant season. Some top pruning may be necessary to allow for root loss during digging.

To plant shrubs or trees by bare-rooted method:

1. Check and remove any dead or damaged roots. Make the cut just behind the break. Prune the top, if necessary, by removing the lateral, not the terminal, branches.



INSTRUCTION SHEET II, (page 2)

2. Dig a hole that is 12" wider than the root spread and 6" deeper than the length of the root system.

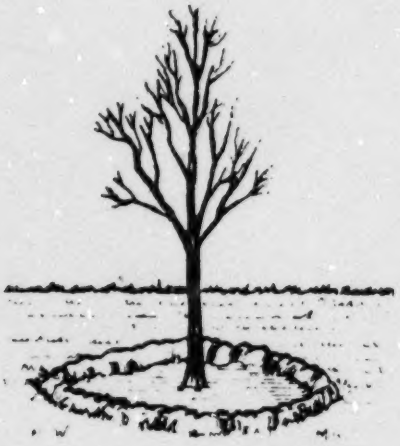
3. Mix one part of peat moss with two parts of the soil removed from the hole; mix on plastic or burlap.

4. Put about 12" of this mixture in the bottom of the hole.

5. Hold the plant in the center of the hole at the some depth as it originally grew. Add the soil mixture to the hole, working it around the spread-out root system and firming it with the fingers.

INSTRUCTION SHEET II, (page 3)

6. Fill the hole about 1/2 full with soil mixture. Firm it with your hands. Then add water to fill the hole.



8. Fill the saucer with water.

9. Place a layer of loose surface mulch such as straw, leaf mold, or pine needles on the surface of the watering basin. This will help conserve moisture and lessen fluctuation in soil temperature. Give special attention to the water needs of the plant throughout the first growing season.

INSTRUCTOR'S FINAL CHECKLIST

PLANTING TREES AND SHRUBS

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

	Accomplished	Not Accomplished
1. In the process of planting a balled and burlapped tree or shrub, the student:		
a. Prepared the site, digging the hole twice the diameter and 12" deeper than the root system.....	[ ]	[ ]
b. Planted the tree at a depth of 1" higher than it originally grew.....	[ ]	[ ]
c. Planted the tree without disturbing the root system.....	[ ]	[ ]
d. Prepared a 2" saucer around the filled area.....	[ ]	[ ]
e. Watered the tree thoroughly.....	[ ]	[ ]
2. In the process of planting a bare-rooted tree or shrub, the student:		
a. Did not allow the roots to dry out.....	[ ]	[ ]
b. Pruned any dead or damaged roots.....	[ ]	[ ]
c. Prepared the site, digging the hole to the proper size.....	[ ]	[ ]
d. Placed the plant at same depth as it previously grew.....	[ ]	[ ]
e. Spread the roots into a natural growing position.....	[ ]	[ ]
f. Planted the tree without damaging the root system.....	[ ]	[ ]

INSTRUCTOR'S FINAL CHECKLIST, (page 2)

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

		Accomplished	Not Accomplished
g.	Firmed and leveled the soil around the roots to the contour of the surrounding soil.....	[ ]	[ ]
h.	Prepared a 2" saucer around the filled area.....	[ ]	[ ]
i.	Watered the tree thoroughly.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: POTTING PLANTS

INTRODUCTION

A customer who goes to the nursery to buy a plant considers not only the beauty and price of the plant, but also how easy it will be to move the plant. It is always good management to have potted plants available. In this task assignment sheet you will learn how to pot plants.

OBJECTIVE

GIVEN a plant, soil mixture, crushed rock, water, and a selection of pots,

POT THE PLANT.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. READ and DISCUSS Instruction Sheet I, HOW TO SELECT PLANT POTS.
2. ANSWER questions about plant pots. Your teacher will provide the questions.
3. READ and DISCUSS Instruction Sheet II, HOW TO POT PLANTS.
4. LOOK AT a variety of potted plants provided by your teacher. ANALYZE each one for pot size, placement of the plant, and depth of the soil to the rim of the pot.
5. PRACTICE potting a plant. Work with a small group of classmates.
6. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

You will be provided the necessary supplies and a plant. Choose the proper size pot and pot your plant.

INSTRUCTION SHEET I

HOW TO SELECT PLANT POTS

A. Pots are often potted:

1. To make them more attractive.
2. To permit them to be moved easily from one location to another.
3. To permit tender plants to be moved indoors when endangered by frost.
4. To allow easy pruning of plant roots without damaging the plant itself.

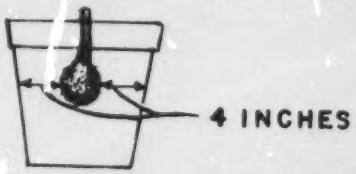
B. Selecting pot size:

1. Keep in mind when selecting pot size:

   a. The mature size of the plant.
   b. The foliage growth of the plant when mature.
   c. The root growth of the plant when mature.

2. The correct size pot should do the following:

   a. Provide a 4" space from the side of the pot to the roots of the plant.



   b. Provide a 6" space from the bottom of the pot to the bottom of the plant.

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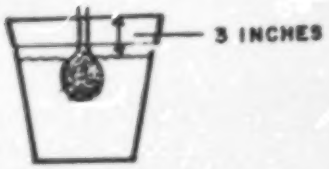
INSTRUCTION SHEET 1, (page 2)

c. Provide a 3" space from the top of the pot to the point where the stem enters the soil.



(1) This space allows the plant room to grow and spread. It provides a stronger root system to take up fertilizer and keep a beautiful appearance.

(2) The foliage of the potted plant should exceed the outer boundaries of the pot in order to be attractive.

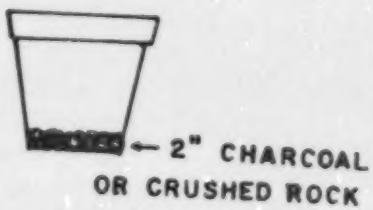
INSTRUCTION SHEET II

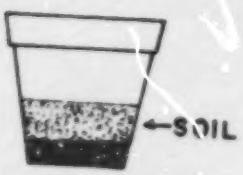
HOW TO POT PLANTS

Potting plants require special care if the plant is to remain healthy and attractive.

To pot plants, follow this procedure:

1. Obtain the kind of soil mixture best suited to the plant.
   a. Some plants require a special soil mixture. Check available literature to determine what you should choose.
   b. Most plants can be potted in a 1-1-1 soil medium mixture. This is usually comprised of equal parts of sand or perlite, soil and peat moss.
2. If the soil mixture is not already sterilized, sterilize it to rid it of insects and/or disease. Place damp mixture in a baking tin and over it. Bake it in an 180° oven for one hour.
3. Select the correct size pot for the plant.
4. Place a piece of clay pot or other material over the hole in the bottom of the pot to prevent the soil from washing out and to aid drainage by preventing the hole from becoming blocked.
5. Put 2" of crushed rock or charcoal in the bottom of the pot. This allows good drainage.

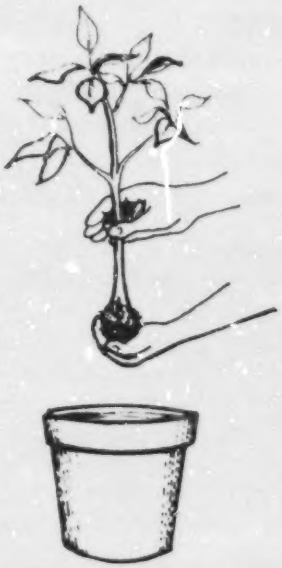


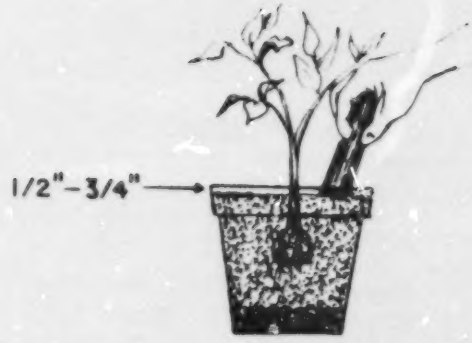


6. Place a layer of the soil on top of the crushed rock to allow space for roots to grow downward.

INSTRUCTION SHEET II, (page 2)

7. Grip one hand around the plant stem at the soil level and place your other hand flat on the bottom of the plant root. Then place the plant directly in the middle of the pot, making sure it is straight.





8. Fill in around the roots with the soil, working it into the crevices with a stick. Make sure the plant is set at the same depth as it was previously growing. The container should be filled to within 1/2"-3/4" of the rim to leave a space that can accumulate water when the plants are watered.

9. Thoroughly soak the plant with water.

INSTRUCTOR'S FINAL CHECKLIST

POTTING PLANTS

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

	Accomplished	Not Accomplished
In potting plants, the student:		
1. Selected the correct size pot.....	[ ]	[ ]
2. Used the correct type soil mixture.....	[ ]	[ ]
3. Lined the bottom of the pot with crushed rock.....	[ ]	[ ]
4. Added a layer of soil mixture on top of the crushed rock.....	[ ]	[ ]
5. Placed the plant directly in the middle of the pot.....	[ ]	[ ]
6. Filled the pot with soil to within 1/2"-3/4" of the rim.....	[ ]	[ ]
7. Soaked the plant with water.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: PRUNING SHRUBS AND HEDGES FOR SHAPING

INTRODUCTION

Sometimes it is necessary to change the growth habit of plants to keep them at a proper size or to thicken the growth. Pruning them can help keep them healthy, encourage bloom, or repair damage. In this task assignment sheet, you will learn how to prune shrubs and hedges.

OBJECTIVES

(1) GIVEN a shrub, pruning shears, and pruning wound paint or sealer,

PRUNE THE SHRUB FOR SHAPING.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

(2) GIVEN a hedge, electric or hand shears, pruning knife, and pruning shears,

PRUNE THE HEDGE FOR SHAPING.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. READ and DISCUSS Instruction Sheet I, HOW TO PRUNE A SHRUB.
2. WATCH your teacher prune a shrub for shaping.
3. PRACTICE pruning a shrub.
4. READ and DISCUSS Instruction Sheet II, HOW TO PRUNE A HEDGE.
5. WATCH your teacher prune a hedge for shaping.
6. PRACTICE pruning a part of a hedge.
7. ARRANGE with your instructor to complete this task by going through the CHECK-OUT ACTIVITIES.

VOCABULARY

Deciduous hedge - a hedge from which the leaves fall annually.

Evergreen hedge - a hedge which keeps its leaves all year.

Foliage - leaves on a plant.

Hedge - a row of closing planted shrubs or bushes forming a fence.

Prune - to cut out or get rid of.

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CHECK-OUT ACTIVITIES

1. You will be provided a shrub and the necessary supplies. Prune the shrub for shaping.

AND/OR

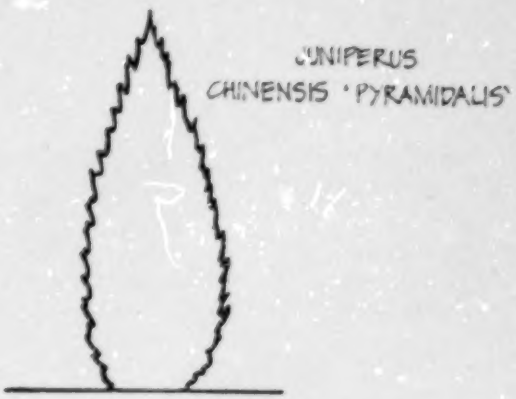
2. You will be provided a hedge and the necessary tools. Prune the hedge for shaping.

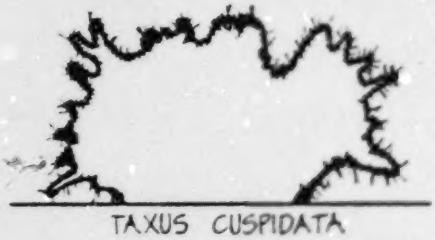
INSTRUCTION SHEET I

HOW TO PRUNE A SHRUB

To prune a shrub to its natural shape:

1. Identify the shrub to be pruned and determine its natural form.





2. Determine the correct time of year or stage of growth for pruning. Prune most broad-leafed evergreens before new growth starts in the spring. Prune small-leaved evergreens when the new foliage is soft.

3. Select the necessary pruning tools and materials.

   a. Examine the tools for correct and safe operating conditions.
   b. Check for rust, dust, plant sap, loose nuts, and nicks.
   c. Use only clean tools that are in good, safe working condition.

4. View the shrub from all sides. Keep in mind the natural shape of the shrub. Determine where cuts should be made to bring the shrub to its natural shape.

INSTRUCTION SHEET I, (page 2)

5. Make smooth cuts 1/4" above the bud.

6. Apply a pruning wound paint or sealer to all pruning cuts 1" in diameter or larger.

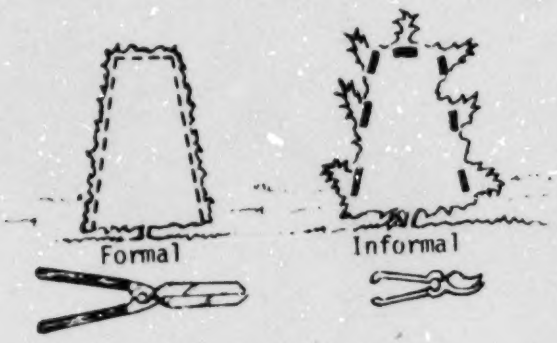
7. Clean the area of all clippings. Dispose of clippings in an acceptable manner.

8. Clean and return all pruning tools to their proper storage area.

INSTRUCTION SHEET II

HOW TO PRUNE A HEDGE

Hedges are basically of two shapes: formal and informal. Formal hedges are pruned so that they have hard flat surfaces. An informal hedge has soft, flowing lines. Evergreen hedges are usually pruned to a formal shape. Deciduous hedges are usually pruned to an informal shape.



Formal hedges must be pruned so that their sides slope slightly at the top. If they flare out at the top, the lower leaves do not get enough light and air. This causes them to drop off, leaving a hedge that is open, twiggy, and leggy at the bottom.

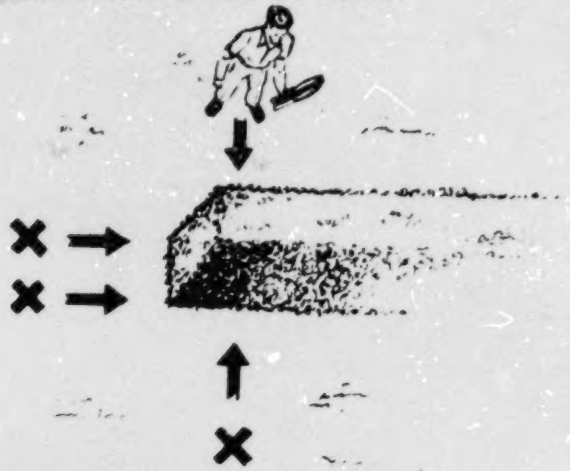
To prune a hedge:

1. Determine whether it should be pruned to a formal or informal shape.
2. Determine the correct time of year or stage of growth to prune the hedge.
3. Select the necessary pruning tools and materials.

INSTRUCTION SHEET II, (page 2)

4. Examine the pruning tools for correct and safe operating conditions. Check for rust, dust, plant sap, loose nuts, and nicks.

5. View the edge from all sides, keeping in mind the desired shape. Visualize where cuts should be made.



6. Prune and/or shear the hedge.

7. Clean the area of all prunings and dispose of them in an acceptable manner.

8. Clean and return all pruning tools to their proper storage areas.

INSTRUCTOR'S GUIDE SHEET

PRUNING SHRUBS AND HEDGES FOR SHAPING

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

	Accomplished	Not Accomplished
1. In pruning shrubs for shaping, the student:		
a. Determined the shrub's pruning needs	[ ]	[ ]
b. Selected the appropriate tools for the task	[ ]	[ ]
c. Pruned during the appropriate stage or growth and time of year	[ ]	[ ]
d. Made all cuts smoothly 1/4" above buds	[ ]	[ ]
e. Pruned the shrub according to its natural shape	[ ]	[ ]
f. Coated all cuts over 1" with pruning wound paint or sealer	[ ]	[ ]
g. Cleaned the area and restored all tools to storage area	[ ]	[ ]
2. When pruning hedges for shaping, the student:		
a. Determined whether deciduous or evergreen hedges should be pruned in a formal or informal shape	[ ]	[ ]
b. Checked the tools and equipment for proper condition	[ ]	[ ]
c. Determined the desired shape and size of the hedge	[ ]	[ ]
d. Pruned the hedge to the appropriate size and shape	[ ]	[ ]
e. Pruned the hedge to allow sunlight to penetrate into all areas of the shrub	[ ]	[ ]
f. Cleaned up area after pruning the hedge	[ ]	[ ]
g. Cleaned and returned all pruning tools to their proper storage area	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

PREPARING A LAWN SEEDBED

INTRODUCTION

A beautiful lawn doesn't "just happen"; it takes a lot of time and effort to get that carpet of green. A lawn is never complete until a desirable turf has been established. The first step, preparing the seedbed for planting, is just as important as watering and fertilizing an older turf. This initial preparation determines the immediate environment the new grass seedlings will have. In this task assignment sheet, you will learn how to prepare a law for seeding.

OBJECTIVE

Given ground limestone, fertilizer, rake, and lawn area,

PREPARE A SEEDBED FOR THE LAW AREA.

THE SEEDBED should be free of debris, properly tilled, raked smooth, with the plant food applied uniformly and tilled into the soil.

LEARNING ACTIVITIES

1. LISTEN as your teacher describes a soil analysis report.
2. READ and DISCUSS Instruction Sheet I, HOW TO PREPARE A LAWN SEEDBED.
3. FIGURE the amounts of ground limestone and fertilizer you will need to prepare your lawn seedbed.
4. WATCH your teacher prepare a lawn seedbed.
5. PRACTICE preparing a small lawn seedbed. Work with a small group of classmates.
6. ARRANGE with your teacher to compute this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

You will be provided the necessary supplies. Prepare a lawn seedbed.

VOCABULARY

Landscaper - One who arranges lawns, trees, bushes, etc. on a plot of ground to make it more attractive.

Turf - A top layer of earth containing grass p'ants with their matted roots; sod.

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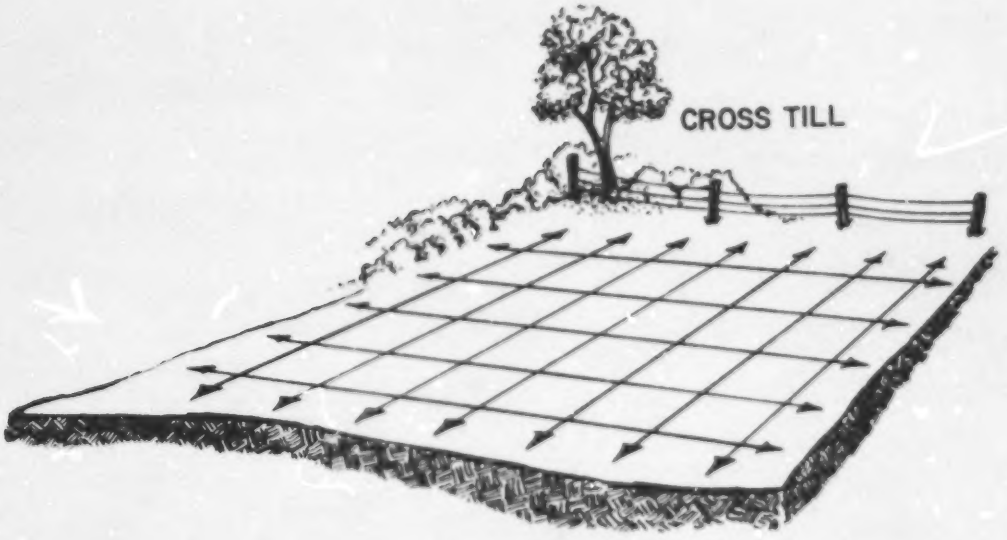
INSTRUCTION SHEET 1

HOW TO PREPARE A LAWN SEEDBED

A properly prepared seedbed is the key to a good turf. Below are steps to follow when preparing a lawn seedbed.

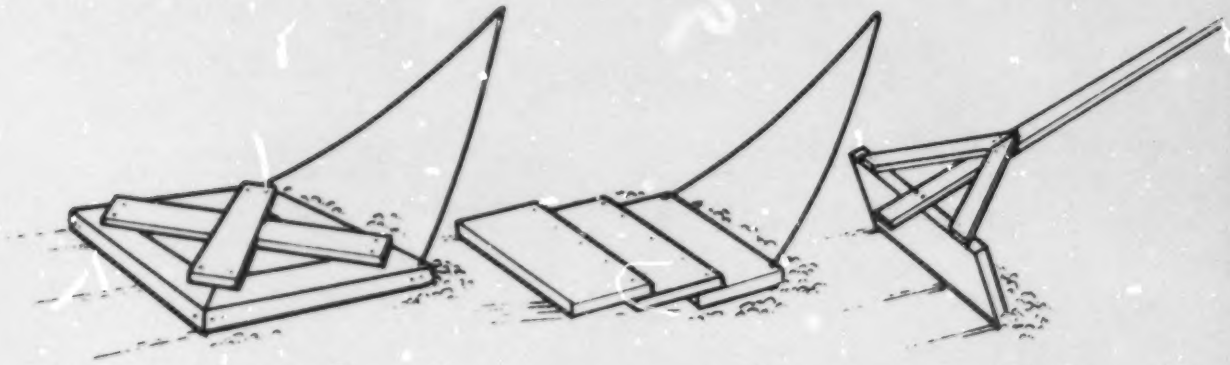
1. After rough grading is completed and the contour is set, final preparation is ready to begin. The soil should be only slightly moist.
2. Remove all the debris (large stones, construction waste, scraps, etc.) from the area.
3. Apply ground limestone at the rate recommended by the soil test.
4. Apply fertilizer at 1/2 the rate recommended by the soil test.



INSTRUCTION SHEET 1 (page 2)

5. Thoroughly till and cross-till the area to a depth of 4-6 inches.

6. Level and smooth the area. Small areas may be smoothed with rakes; however, larger areas may require the use of a small harrow and tractor.



7. After leveling is completed, apply the remaining fertilizer.

8. Rake the fertilizer into the top inch of the soil.

9. Remove all rubbish from the area. The seedbed is now ready to sow.

INSTRUCTOR'S FINAL CHECKLIST

PREPARING A LAWN SEEDBED

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

	Accomplished	Not Accomplished
The student's lawn seedbed:		
1. Was free of debris.....	[ ]	[ ]
2. Was tilled to a depth of 4 to 6 inches.....	[ ]	[ ]
3. Contained plant food over the entire area which was tilled well into the soil.....	[ ]	[ ]
4. Was raked smooth on the surface.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

SOWING LAWNS

INTRODUCTION

A landscaper's goal in sowing a lawn is a thick, well established turf. The method used often determines the quality of the turf. In this task assignment sheet, you will learn how to sow a lawn.

OBJECTIVE

Given a lawn seedbed, grass seed, hand seeder, mulch, pitchfork, lawn roller, string and stakes, and water,

SOW THE LAWN.

YOU WILL be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. READ and DISCUSS Instruction Sheet I, HOW TO SOW A LAWN.
2. WATCH your teacher set and operate a seeder.
   PRACTICE setting and operating a seeder.
3. WATCH your teacher sow a lawn seedbed.
4. PRACTICE sowing a small lawn seedbed.
5. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

You will be provided the necessary equipment and supplies. Sow a portion of the seedbed you prepared in Task Assignment Sheet PA-AG-5.

INSTRUCTION SHEET I

HOW TO SOW A LAWN

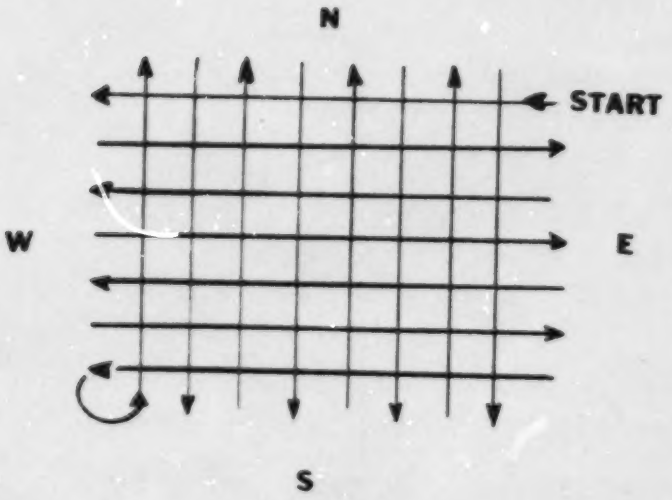
In sowing a lawn, follow these steps:

Seeding

1. Obtain the necessary amount of seed.

2. Set the seeder to apply one-half the recommended rate. Adjust the seeder to one-half the setting recommended in the owner's manual or the table attached to the seeder. For example, if bluegrass is to be sown and the owner's manual or table recommends a setting of four, then the seeder should be set at two. The seeder is set at one-half rate because one-half of the seed should be sown in a north-south direction and the other one-half in an east-west direction over the area.

SEEDING PATTERN



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INSTRUCTION SHEET 1, (page 2)

3. Fill the seeder with seed and move to a good starting place.

4. Open the seeding gate as you begin to walk, and operate the seeder in a smooth, continuous motion.

5. After you have finished seeding, work the seed into the top 1/4 inch of soil. A rake may be used in small areas.

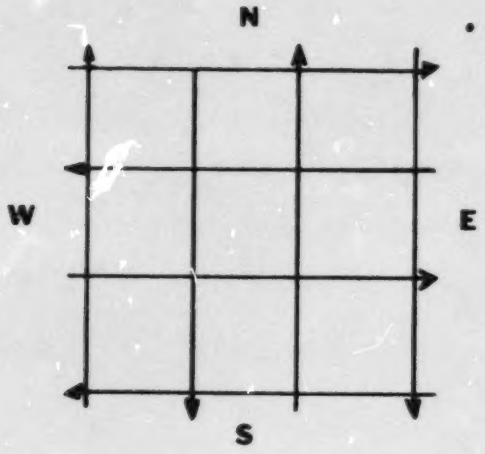
Mulching

6. Using a pitchfork, spread clean straw or other suitable mulch evenly over the area. Spread it 1/4 inch deep, but spread it thinly enough to leave about half of the soil surface exposed.

Rolling

7. Lightly roll the soil area with a lawn roller following the pattern used in sowing the seed. Roll the area in a north-south direction and then in an east-west direction. Overlapping the roller is not necessary.

NOTE: It is important not to have the roller too heavy or the ground may be severely compacted. Rolling can be done before or after mulch is applied.

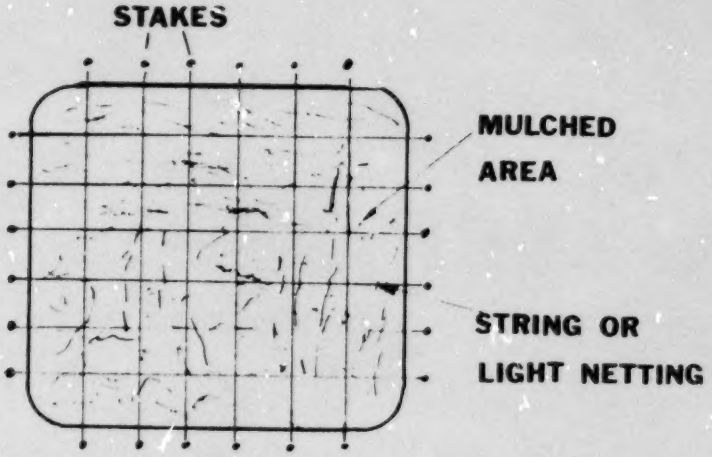


INSTRUCTION SHEET 1, (page 3)

Staking and Stringing

8. Dry mulch has a tendency to blow away. Although rolling will help hold it down, sometimes it is necessary to use a system of stakes and string over the mulch to keep it in place. Drive the stakes and then attach the string in a criss-cross system (see drawing).

   NOTE: A special light-weight net which can be used to hold mulch in place is also available.



Watering

9. Give the area a good sprinkling with water after the stringing or netting has been completed.

10. Unless moisture is provided by rain, water the area several times a week until the seed has sprouted and established a root system.

    The soil should be kept moist, but not watered to the point of run-off. Remember, there is no substitute for regular watering.

INSTRUCTOR'S FINAL CHECKLIST

SOWING LAWNS

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

	Accomplished	Not Accomplished
In sowing a lawn, the students:		
1. Sowed the seed:		
a. Set the seeder at the proper rate.....	[ ]	[ ]
b. Filled the seeder with the proper amount of seed.....	[ ]	[ ]
c. Seeded in a north-south and east-west direction.....	[ ]	[ ]
d. Operated the seeder in a smooth, continuous motion.....	[ ]	[ ]
e. Worked the seed into the top 1/4 inch of soil.....	[ ]	[ ]
2. Applied mulch:		
a. Applied a 1/4 inch deep layer of mulch.....	[ ]	[ ]
b. Left half of the soil surface exposed.....	[ ]	[ ]
3. Rolled the soil area:		
a. Lightly rolled the soil area with a lawn roller.....	[ ]	[ ]
b. Rolled the area in a north-south and east-west direction.....	[ ]	[ ]
4. Ran strings over the area in a crisscross system.....	[ ]	[ ]
5. Watered the area thoroughly.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

CLEANING A SMALL ENGINE

INTRODUCTION

Cleaning a small engine prevents internal damage to the engine. It also gives the mechanic the opportunity to check for loose nuts and bolts and for broken, cracked, or damaged parts. In this task assignment sheet, you will learn how to clean a small engine.

OBJECTIVE

Given a small engine, degreaser, and the necessary tools,

DEMONSTRATE HOW TO CLEAN THE ENGINE.

YOU will be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. LISTEN to your teacher explain the importance of keeping an engine clean.
2. READ and DISCUSS Instruction Sheet 1, HOW TO CLEAN A SMALL ENGINE. LOOK AT the parts of the engine to be cleaned.
3. WATCH your teacher clean a small engine. LISTEN as he/she explains safety rules that must be observed.
4. PRACTICE cleaning a small engine.
5. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

You will be provided a small engine, degreaser, and the necessary tools. Demonstrate how to clean the engine.

INSTRUCTION SHEET 1

HOW TO CLEAN A SMALL ENGINE

To clean a small engine:

1. Allow the engine to cool if it has been running.
2. Remove the blower shroud and cylinder baffles.
3. Remove the air-cleaner. Cover the air-cleaner opening with a piece of plastic. Use a rubber band to hold it in place.
4. Clean the exhaust system. If your engine is a two-cycle engine, clean the exhaust ports with a wooden scraper.
5. Apply degreaser on all parts that need cleaning. If the degreaser is not in a pressure-type can, apply it with a paint brush or hand sprayer. Apply it until the parts have a wet appearance. Brush heavily soiled spots until the degreaser begins to dissolve them.
6. Let the degreaser set about five minutes.
7. Remove the degreaser with a strong stream of water.
8. Use a scraper or stiff bristled brush to remove dirt that did not flush off.
9. Remove the protective cover over the air-cleaner opening.
10. Replace the air-cleaner, cylinder baffles and blower shroud.
11. Run the engine immediately for at least three minutes.

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INSTRUCTOR'S FINAL CHECKLIST

CLEANING A SMALL ENGINE

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

When demonstrating how to clean a small engine, the student:

1.	Allowed the engine to cool, if necessary.....	[ ]	[ ]
2.	Removed the blower shroud and cylinder baffles.....	[ ]	[ ]
3.	Removed the air-cleaner and covered the opening.....	[ ]	[ ]
4.	Cleaned the exhaust system properly.....	[ ]	[ ]
5.	Applied the degreaser properly.....	[ ]	[ ]
6.	Removed the degreaser properly.....	[ ]	[ ]
7.	Removed dirt that did not flush off.....	[ ]	[ ]
8.	Replaced the air-cleaner properly.....	[ ]	[ ]
9.	Ran the engine immediately for at least three minutes.....	[ ]	[ ]
10.	Observed all safety rules.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

OPERATING A SMALL ENGINE

INTRODUCTION

A small engine and the equipment it operates can be dangerous if it is not operated properly. In this task assignment sheet, you will learn how to start and operate a small engine.

OBJECTIVE

Given a piece of small engine powered equipment and the operator's manual,

START, OPERATE, AND STOP THE ENGINE.

YOU SHOULD start, adjust the speed and load, and stop the engine according to the instructions in the operator's manual.

LEARNING ACTIVITIES

1. LISTEN as your teacher explains safety rules to observe when starting and operating a small engine. LIST what precautions should be taken when starting, operating, and stopping an engine.
2. READ the operator's manual on starting, adjusting the speed and load, and stopping a small engine.
3. PRACTICE starting, adjusting the speed and load, and stopping the engine.
4. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Start, operate, and stop a small engine. Follow the directions in the operator's manual.

INSTRUCTOR'S FINAL CHECKLIST

OPERATING A SMALL ENGINE

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

In operating a small engine, the student:

1.	Took the proper safety precautions before starting the engine.....	[ ]	[ ]
2.	Started the engine properly.....	[ ]	[ ]
3.	Adjusted the engine to the proper speed.....	[ ]	[ ]
4.	Gradually applied the load to the engine.....	[ ]	[ ]
5.	Avoided overloading the engine.....	[ ]	[ ]
6.	Stopped the engine properly.....	[ ]	[ ]
7.	Operated the engine in a safe manner at all times.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

IDENTIFYING BREEDS OF BEEF CATTLE

INTRODUCTION

Livestock production is big business in Kentucky. Breeds of horse, swine, sheep, poultry, dairy cattle, and beef cattle are all produced here. One of the most important kinds of livestock produced here is beef cattle. In this task assignment sheet, you will learn about the most common breeds of beef cattle found in Kentucky.

OBJECTIVE

Given a list of beef cattle features and of beef cattle breeds,

MATCH EACH FEATURE TO THE PROPER BREED.

YOU should do this with 100% accuracy.

LEARNING ACTIVITIES

1. FIND and STUDY pictures of different breeds of beef cattle.

2. REPORT on the history of one of the following breeds of beef cattle: angus, hereford, charolais, or simmental.

3. CONTACT your local extension agent and/or a FFA member. Ask him/her to identify places in your area where angus, hereford, charolais, and simmental cattle can be found. VISIT one of these places. TAKE pictures or write your own description of the breed of cattle there.

   or

   INTERVIEW someone you know who produces these breeds of cattle. ASK him/her to describe some of the physical features of the cattle.

4. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Your teacher will provide a list of beef cattle features and beef cattle breeds. Match each feature to the breed.

VOCABULARY

Breed - A particular type of animal which, for a long period, has been bred only with those of the same type.

Forage - To search for food.

Livestock - animals kept for use on a farm or raised for sale.

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INSTRUCTOR'S FINAL CHECKLIST

IDENTIFYING BREEDS OF BEEF CATTLE

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

The student matched the features to the breeds with 100% accuracy..... [ ] [ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE

INTRODUCTION

There are several parts of an underground coal mine. Being able to identify them aids the coal miner in understanding underground coal mining operations. In this task assignment sheet, you will become familiar with the parts of an underground coal mine.

OBJECTIVE

GIVEN pictures of ten parts of an underground coal mine,

IDENTIFY EACH PART.

YOU should identify at least nine parts correctly.

LEARNING ACTIVITIES

1. EXAMINE and DISCUSS the drawings in Instruction Sheet I, PARTS OF AN UNDERGROUND COAL MINE. STUDY the vocabulary words as you examine the pictures.

2. Visit a simulated coal mine. WRITE a description of each part of the mine.

   or

   BUILD a model underground coal mine. LABEL each part.

3. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Your teacher will provide pictures of ten parts of an underground coal mine. Write the name of each part.

VOCABULARY

Coal seam - the layer of coal underground.

Crosscut - short passageways driven at right angles to an entry. They connect one entry to another.

Entry - the main passage driven into a coal seam.

Face - the area from which coal is being taken. A mine may have many operating faces.

Floor - any material that is put back in place of the extracted coal to provide ground support.

Intersection - the area in a mine where a crosscut connects with another entry.

Pillars - large blocks of coal left after entries and crosscuts have been made. They help support the mine roof.

Ribs - the sides of a pillar or of an entry. The solid coal on the side of any underground passage.

Roof - the layer of hardened clay, limestone, sandstone, or other materials that lies over the coalbed; the top of an entry.

Room - the area from the entry or crosscut to the face.

Simulated - imitation.

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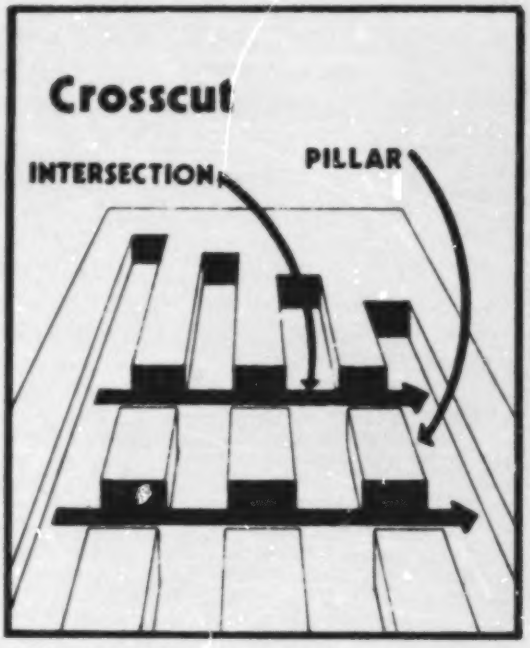
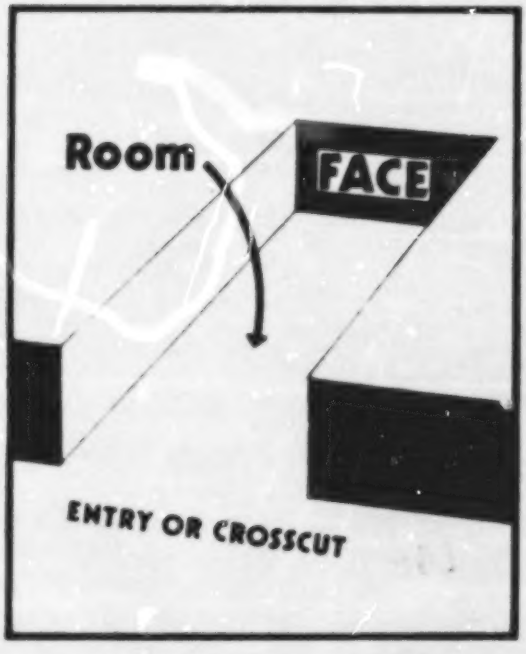
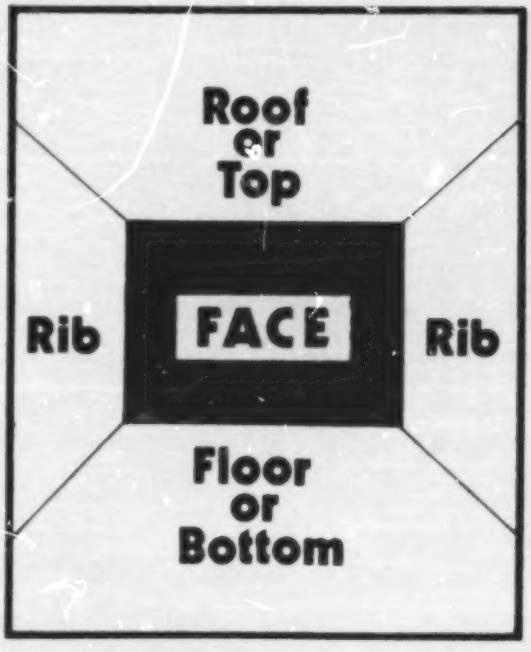
INSTRUCTION SHEET 1

PARTS OF AN UNDERGROUND COAL MINE



Note: Number the pillars according to the system used at your mine.





INSTRUCTOR'S FINAL CHECKLIST

IDENTIFYING PARTS OF AN UNDERGROUND COAL MINE

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

The student correctly identified nine of the ten parts of an underground coal mine..... [ ] [ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: IDENTIFYING BASIC MINING EQUIPMENT

INTRODUCTION

There are basic pieces of equipment that are used in coal mining. A coal miner must be familiar with each piece in order to understand the mining cycle. In this task assignment sheet, you will become familiar with the basic mining equipment.

OBJECTIVE

GIVEN drawings of nine pieces of basic mining equipment,

IDENTIFY EACH PIECE OF EQUIPMENT AND EXPLAIN HOW IT IS USED.

YOU should correctly identify and explain the use of at least eight pieces of equipment.

LEARNING ACTIVITIES

1. STUDY the drawings in Instruction Sheet I, BASIC MINING EQUIPMENT.
2. LISTEN as your teacher describes how each piece of mining equipment is used.
3. PRACTICE identifying basic mining equipment. Your teacher will tell you more about this activity.
4. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Your teacher will provide drawings of basic mining equipment. Name each piece of equipment and explain how it is used.

VOCABULARY

Conventional mining - the mining method in which coal is undercut and blasted loose to be gathered for transport by machine.

Surface mining - the mining method in which coal is extracted through the surface of the ground.

Roof bolt - a long steel bolt, which is inserted in a drilled hole, used to support the mine roof.

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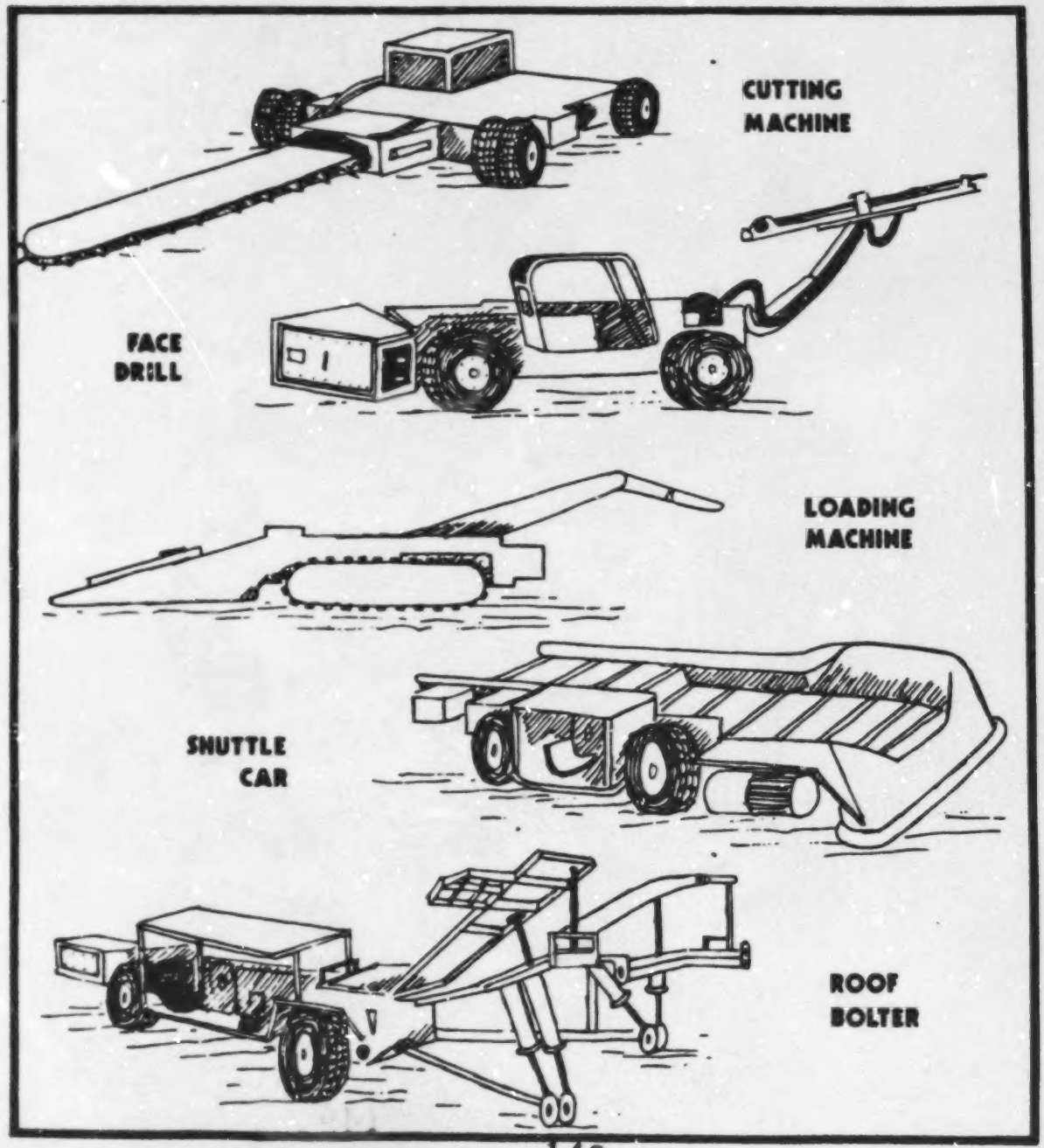
INSTRUCTION SHEET 1

BASIC MINING EQUIPMENT

Conventional Mining



INSTRUCTION SHEET 1, (page 2)

SURFACE MINING EQUIPMENT

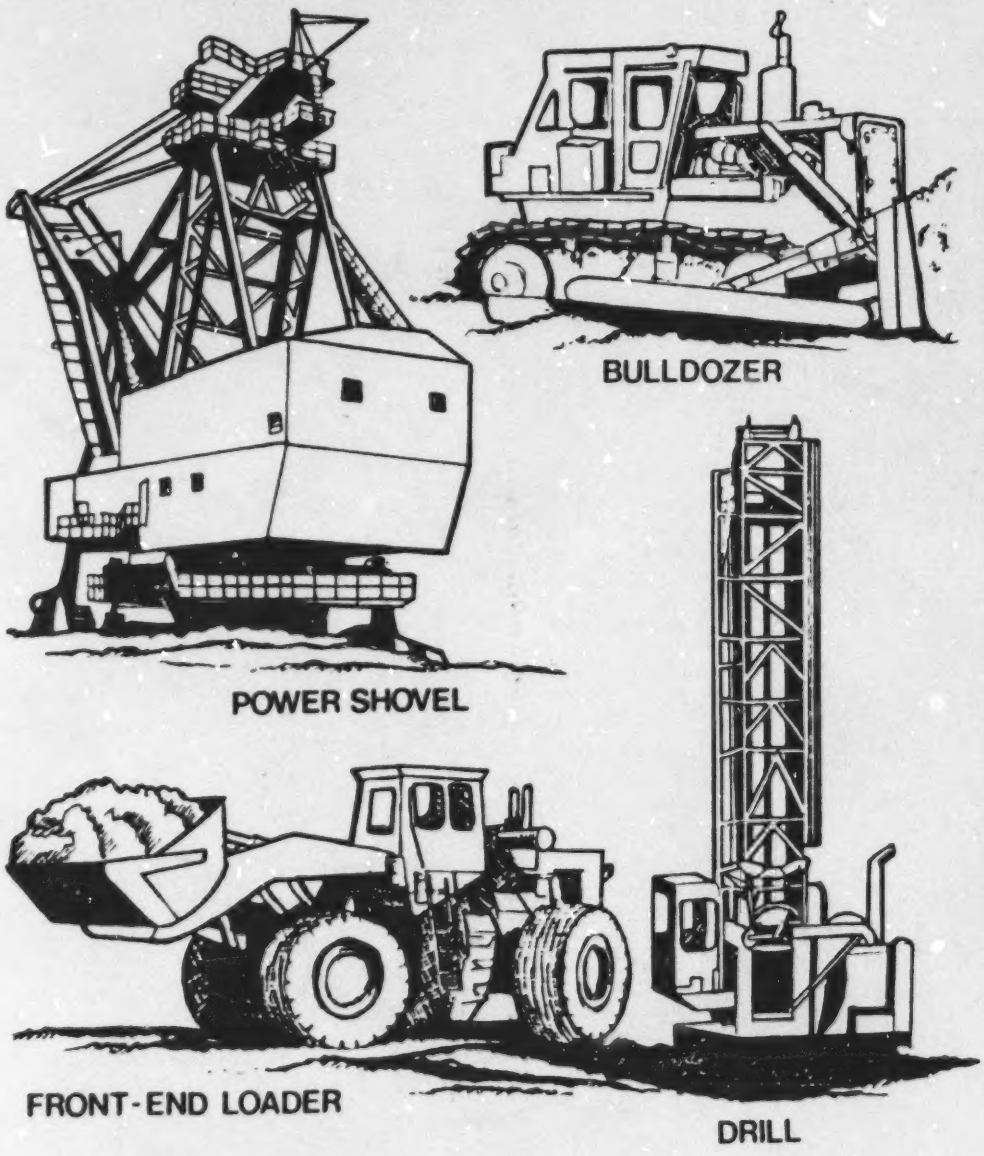


Illustration reprinted from Kentucky Mine Safety Training Program, Trainer Handbook (Surface), Kentucky Department of Education (Frankfort, n.d.).

INSTRUCTOR'S FINAL CHECKLIST

IDENTIFYING BASIC MINING EQUIPMENT

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

In identifying basic mining equipment, the student:

1. Identified at least eight pieces of equipment correctly ..... [ ] [ ]

2. Explained the use of at least eight pieces of equipment correctly ..... [ ] [ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: CLASSIFYING ROCKS

INTRODUCTION

A petroleum geologist studies rock and mineral formations to figure out places where oil and gas are likely to be found. In this task assignment sheet, you will learn to classify rocks and minerals.

OBJECTIVE

GIVEN a rock classification worksheet,

EXPLORE AND CLASSIFY ROCKS.

YOU should explore at least five rocks and complete the worksheet for each one.

LEARNING ACTIVITIES

1. LISTEN as your teacher discusses minerals. LIST minerals which are found in this state.
2. GROW some crystals. Your teacher will tell you how to do this. OBSERVE and DESCRIBE some of the crystals in class.
3. LOOK AT grains of sand, salt, and sugar under a microscope. DRAW the most noticeable shape you see.
4. FIND rocks and BRING them to class. WATCH and LISTEN as your teacher explains how to classify a rock.
5. CLASSIFY one of the rocks in class.
6. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Your teacher will provide a rock classification worksheet. Explore at least five rocks and complete the worksheet for each one. If possible, explore one rock that is too large to remove from its place.

VOCABULARY

Crystal - a clear, transparent mineral that looks like ice.

Igneous rock - molten material from within the earth that cooled and hardened to form rock; usually is found well below the surface of the earth.

Luster - a bright shine on the surface.

Mineral - any of certain elements such as iron and gold; the same as ore.

Metamorphic rocks - rocks that have been changed by heat and pressure. They are usually layered or banded.

Petroleum - an oily, flammable, liquid found in the layers of certain rock formation.

Sedimentary rocks - rocks that have been formed by layers of mud and sand; as one layer after another builds up, the lower layers form rock. They show definite layers.

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INSTRUCTOR'S FINAL CHECKLIST

CLASSIFYING ROCKS

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

In classifying rocks, the student:

1. Explored at least five rocks ..... [ ] [ ]
2. Completed the rock classification worksheet for each rock ..... [ ] [ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: IDENTIFYING PARTS OF A TREE

INTRODUCTION

Forests are one of our renewable resources. They provide a variety of materials for your needs and comfort, and they will continue to do so if properly managed. The forester is concerned about the care of our forests. In order to take the best care of trees, he/she must be familiar with the structure of a tree. In this task assignment sheet, you will learn the parts of a tree.

OBJECTIVE

GIVEN a drawing of a tree,

IDENTIFY EACH PART OF THE TREE.

YOU should identify at least nine of the parts correctly.

LEARNING ACTIVITIES

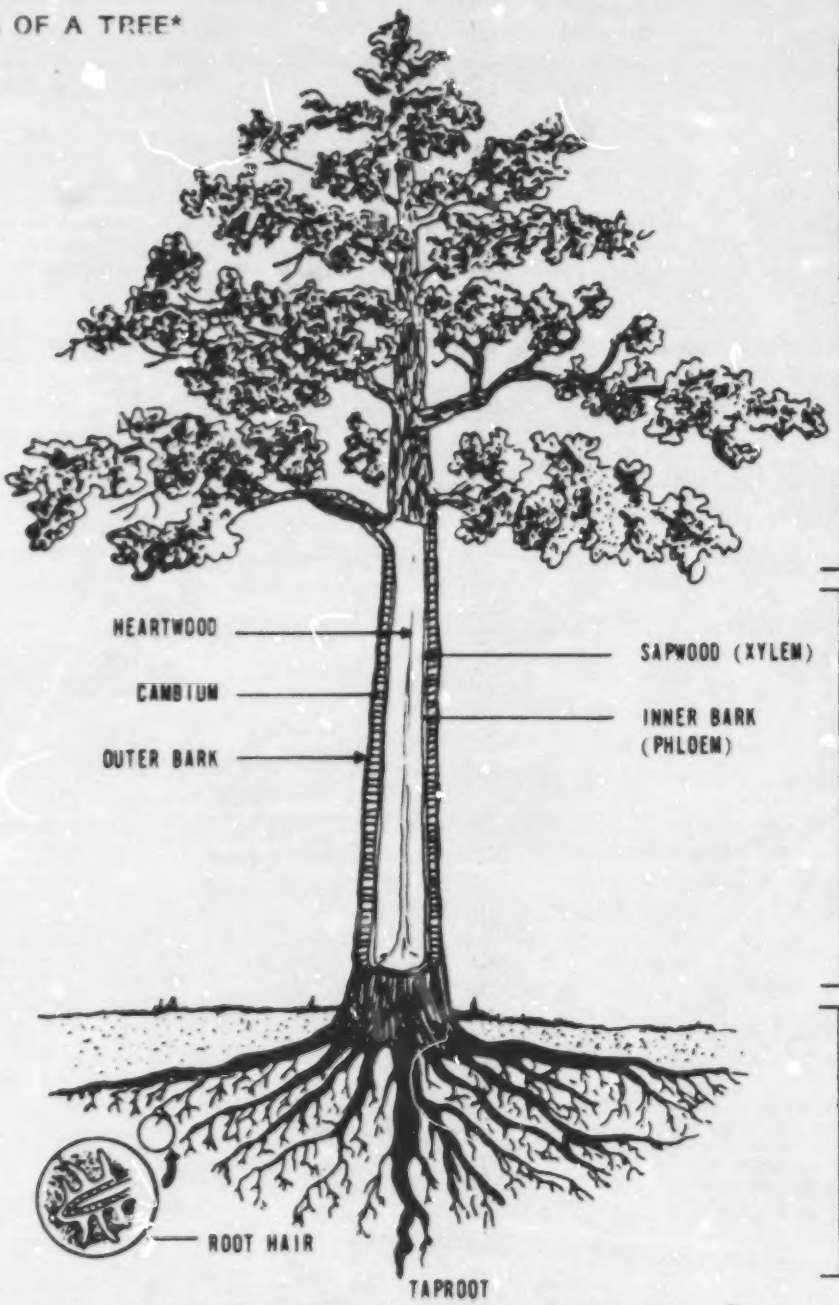
1. STUDY and DISCUSS Instruction Sheet I, PARTS OF A TREE.
2. LISTEN to your teacher explain the functions of the three main parts of a tree.
3. OBTAIN a guide which will help you become familiar with the parts of a tree. Your teacher will provide one. SELECT a tree and EXAMINE each part as listed on your guide. REPORT your findings to the class.
4. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Your teacher will provide a drawing of a tree. Write the name of each part of the tree.

INSTRUCTION SHEET I

PARTS OF A TREE*



*Taken from Natural Resources and Career Awareness, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

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INSTRUCTOR'S FINAL CHECKLIST

IDENTIFYING PARTS OF A TREE

	Accomplished	Not Accomplished
Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.		
The student identified at least nine parts of the tree correctly.....	[ ]	[ ]

Practical Arts

AGRIBUSINESS/NATURAL RESOURCES EXPLORATION

TASK: IDENTIFYING TREES TO BE HARVESTED

INTRODUCTION

Trees age as they grow, and eventually they become mature. When they reach maturity, the forester must make a choice between harvesting them or letting them stand. In this task assignment sheet, you will learn how to identify trees that should be harvested.

OBJECTIVE

GIVEN a drawing of an uncut forest stand,

IDENTIFY THE TREES THAT SHOULD BE REMOVED FOR A SINGLE-TREE SELECTION HARVEST CUT.

YOU should identify the trees accurately.

LEARNING ACTIVITIES

1. STUDY the drawings in Instruction Sheet I, HARVEST CUTTING METHODS. LISTEN to your teacher explain each method.

2. VISIT a forest and LOOK AT areas that have been harvested. REPORT to the class.

   OR

   INTERVIEW a forester about selecting trees to be harvested. REPORT to the class.

   OR

   EXAMINE a stand of trees at school or in your community. IDENTIFY the ones that should be harvested to allow the best trees room to grow.

3. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

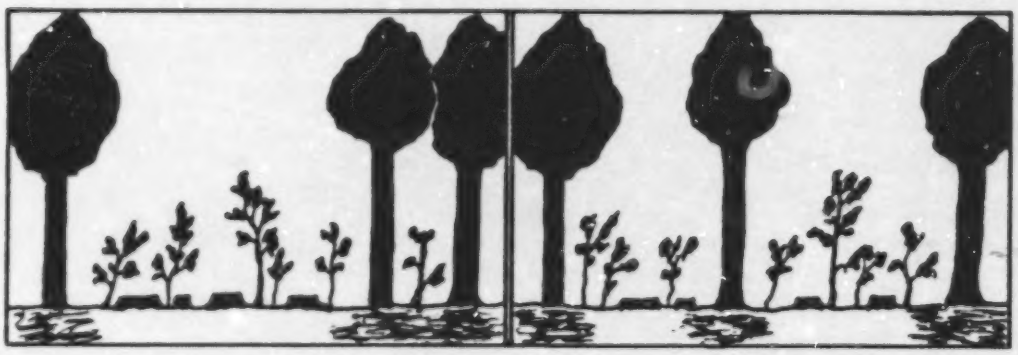
Your teacher will provide a drawing of an uncut forest stand. Identify the individual trees that should be removed that will allow the best trees room to grow.

INSTRUCTION SHEET I

HARVEST CUTTING METHODS*

Uncut forest stand.

After single-tree selection harvest cut.



After group-selection harvest cut.

After shelterwood harvest cut.

After clearcut.

*Adapted from Forests and Foresty in Kentucky, University of Kentucky.

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INSTRUCTOR'S FINAL CHECKLIST

IDENTIFYING TREES TO BE HARVESTED

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

The student identified the accurate trees to be cut for a single-tree selection harvest..... [ ] [ ]